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OUTLINES

OF THE

PHYSIOGNOMICAL SYSTEM

OF

DRS. GALL AND SPURZHEIM:

INDICATING

THE DISPOSITIONS AND MANIFESTATIONS

OF

THE MIND.

BY J. G. SPURZHEIM, M. D.

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PREFACE.

AS at the present day the greater number of readers are satisfied with outlines of scientific truths ; as many of them even judge of the nature and appreciate the value of a book according to the mere extracts made from it, or the opinions given of it, by journalists and reviewers ; and as very few have the patience to peruse and examine a more detailed and systematic work, I now offer to the British Public a sketch of our physiognomical doctrines, in order to enable every class of readers to ascertain the real nature and object of our investigations. Here however I beg leave to observe, that the expression physiognomical doctrines does not indicate the whole object of our inquiries. Their real object is the knowledge of man in general, and of his mind and its expressions in particular, both in the state of health and of

disease. One portion of it, indeed must, as to its application, be termed physiognomical; and this portion certainly interests every intelligent person, to whatever class of readers he may belong.

I shall divide this sketch of our doctrine into seven chapters: in the first, I shall speak briefly of the history of our inquiries;—in the second, of the means which we employ in order to point out the organs of the mind;—in the third, of the peculiar faculties of the mind, their respective organs, and the external sign of these organs;—in the fourth, of the principles of pathognomy or natural language;—in the fifth, of some philosophical considerations;—in the sixth, of the inferences which may be drawn from the observations contained in the preceding chapters;—and in the seventh, of the application of our inquiries to the sciences and the arts, to education and to legislation.

It must be understood that I can in none of these chapters enter into details; and can, indeed, merely sketch our statements,

without answering objections to them. Those, however, who may wish to become acquainted with them in all their details will find them in the larger work entitled “The Physiognomical System of Drs. Gall and Spurzheim : printed for Baldwin, Cradock, and Joy, 47, Paternoster Row, London.

J. G. SPURZHEIM, M. D.

11, Rathbone Place, London,
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CONTENTS.

	Page
PREFACE - - - - -	iii
INTRODUCTION - - - - -	1

CHAPTER I.

HISTORICAL NOTICE OF OUR INQUIRIES -	7
--------------------------------------	---

CHAPTER II.

MEANS OF POINTING OUT THE ORGANS OF THE MIND.

Means employed by other natural philosophers -	18
Our manner of determining the functions of the brain	26
Cause of the form and size of the head - -	30
Possibility of distinguishing the size of the brain -	37
Difficulties of distinguishing the size of certain parts of the brain - - - - -	40
Impossibility of determining the size of the brain -	44

CHAPTER III.

PECULIAR ORGANS OF THE MIND.

External senses - - - - -	61
Generalities as to the five external senses - -	64
Feeling - - - - -	71
Taste - - - - -	76
Smell - - - - -	78
Hearing - - - - -	79
Sight - - - - -	81
Internal organs of the mind - - - - -	84
Amativeness - - - - -	108

Philoprogenitiveness	-	-	-	-	110
Inhabitiveness	-	-	-	-	115
Adhesiveness	-	-	-	-	119
Combativeness	-	-	-	-	123
Destructiveness	-	-	-	-	125
Constructiveness	-	-	-	-	143
Covetiveness	-	-	-	-	145
Secretiveness	-	-	-	-	152
Self-esteem	-	-	-	-	155
Love of approbation	-	-	-	-	156
Cautiousness	-	-	-	-	158
Benevolence	-	-	-	-	160
Veneration	-	-	-	-	164
Hope	-	-	-	-	168
Ideality	-	-	-	-	169
Conscientiousness	-	-	-	-	171
Firmness	-	-	-	-	175
INTELLECTUAL FACULTIES	-	-	-	-	177
Individuality	-	-	-	-	178
Form	-	-	-	-	182
Colouring	-	-	-	-	185
Locality	-	-	-	-	189
Number	-	-	-	-	198
Tune	-	-	-	-	199
Language	-	-	-	-	201
Comparison	-	-	-	-	214
Causality	-	-	-	-	215
Wit	-	-	-	-	218
Imitation	-	-	-	-	219

CHAPTER IV.

CHAPTER V.

PSYCHOLOGY	-	-	22
------------	---	---	----

CHAPTER VI.

INFERENCES TO BE DRAWN FROM THE PRECEDING CHAPTERS.

The manifestations of the mind depend on the organi-			
zation	-	-	248
Innateness of the faculties of man	-	-	26
Is the knowledge of nature dangerous to morality			
and religion	-	-	277
Materialism	-	-	282
Fatalism	-	-	285
Moral liberty	-	-	290

CHAPTER VII.

PRACTICAL CONSIDERATIONS.

Social intercourse	-	-	304
Characters are different	-	-	305
Modifications of the manifestations of every faculty			306
Difficulty of judging the actions of other persons			30
Sympathy and antipathy	-	-	313
Influence of our doctrine upon arts	-	-	316
On education	-	-	317
On criminal legislation	-	-	323
On the derangements of the manifestations of the			
mind	-	-	325

OUTLINES

OF THE

PHYSIOGNOMICAL SYSTEM

OF

DRS. GALL AND SPURZHEIM.

INTRODUCTION.

THIS new physiognomical system cannot be considered as an art, according to which it is possible to discover the particular actions of individuals. We never treat of determinate actions; we consider only the faculties man is endowed with, the organic parts by means of which these faculties are manifested, and the general indications which they present. The aim of our inquiries, in general, is to contribute to the knowledge of human nature; and the object of this physiognomical system in particular is to distinguish, by external signs, both the innate dispositions of the mind and their activity.

Every one must agree that the knowledge of man is of the deepest interest, to natural

philosophers, anatomists, physiologists, physicians, artists, teachers, moralists and legislators. Reflecting men in all ages have thought it especially worthy of their attention; they have taken notice of the actions of the most remarkable individuals, as well as of men in general; they have inquired into the number and the nature of the faculties of man; and they have invented many systems in respect to the causes of his actions. Though men, however, of almost every profession have thus endeavoured to elucidate human nature, it must be allowed that our knowledge of mankind is still extremely defective.

It is known that there are many general obstacles to the improvement of every art and science, as the religious respect which men have for ancient opinions, and their aversion from new ones; the obligation and the care of maintaining adopted opinions; our inaptness to think for ourselves; the want of precision and clearness in our ideas and expressions; the mania of forming systems upon a few solitary facts and hasty conceptions; the jealousy, the envy, the falsehoods of opponents; and their malice in drawing dangerous consequences from

the most innocent statements &c. There are also particular obstacles to any scientific inquiry; those of the ignorance in anthropology may be divided into natural and artificial. Among the natural, the most important is the difficulty which the examination of mankind presents. It is easy to describe minerals, their volume, figure, weight, density, colour and other physical qualities; hence mineralogy is eminently advanced. We may also at our leisure describe and make drawings of animals; we may anatomize and preserve them with safety and ease; but it is not so easy to observe the facts concerning the life of animals, to inquire into their instinctive labours, their propensities and their intellectual faculties. In anthropology anatomical and physiological knowledge of the nervous system and of the brain is the most difficult, and has therefore made the slowest progress. Till our days, the external forms only of the brain were known, and the internal structure of its parts were quite overlooked. The physiology of the nervous system and of the brain shows only a succession of error, ever conformable to the prevailing philosophical system.

The chief of the artificial impediments to the improvement of anthropology was the blameable method which has been employed in the study of man, all phenomena being explained by hypotheses or by imagination alone. The schoolmen attribute all the operations of man to the soul; several of them even give to it an unbounded power over the body. Moreover, the failure to compare man with other beings has been a great obstacle to the progress of anthropology. There exist even at this day, philosophers who maintain that man is not at all subjected to the laws of nature, that independently of all causes and motives he may originate a series of actions, and that his functions do not admit of any explanation. According to this hypothesis, man is separated from all other beings; he is considered as a being entirely regulated by laws peculiar to himself. The various branches of anthropology, instead of being united, are cultivated separately; the useful example of the Greek philosophers is neglected; anatomy, physiology, medicine, philosophy, education, religion and legislation, instead of uniting their mutual influence, constitute so many particular doctrines.

Man must be considered as a being of creation; and the study of his nature requires the same method as the examination of every other natural being. Thus, it is necessary to study in man, 1st, the structure of the whole body and that of each part in particular. 2d, The functions in general and those of every part in particular. 3d, The mutual influence of the different parts and their functions; and 4th, The relations between man and all the beings around him, whether inanimate or animate, even the relation to his Creator.

Though anatomical structure precedes in existence every kind of function, and though the structure of any part has the most intimate relation to its function, I however shall pass over our anatomical inquiries, and refer those who may feel some interest in these investigations, to my work on the Physiognomical System, and to the first volume of our large work entitled *Anatomie et Physiologie du Système Nerveux en général, et du Cerveau en particulier*.

CHAPTER I.

HISTORICAL NOTICE OF OUR INQUIRIES.

IT is acknowledged that Dr. Gall has the merit of having first begun these inquiries. He had pointed out many relations which exist between various *actions* of man and animals and certain cerebral parts, before I was so happy as to become acquainted with him. As, however, I have been associated in these examinations during many years, and have been especially charged with the prosecution of the anatomical part, and as I have not a little contributed to extend, to perfect and to establish the new doctrine, Dr. Gall himself thinks it just to speak of *our* inquiries, and for several years past he has held this language.

Dr. Gall, from his earliest youth, was attentive to the difference which existed between his brothers and sisters, and his school-fellows. He was particularly vexed, that while several of his school-fellows learned by heart even things which they did not understand, with great facility, he had the utmost difficulty in engraving in his memory

a smaller number of words. On the other hand, however, he found that he excelled them in the powers of reflection and reasoning. He afterwards observed, that in those individuals who had so great a verbal memory, the eyes were very prominent; and this observation was the commencement of all his future inquiries into psychology. Studying medicine, he learned that the functions of the brain were not known; but at the same time observing that prominent eyes indicate a good verbal memory; he thought that other internal faculties might perhaps be distinguished by the external form of the head.

Gall, for a long time, participated in all the errors of philosophy, and he did not leave this false mode of reasoning, till he had perceived that all his researches were useless. At first he had compared the size and form of the whole head only with the general faculties of the understanding: he looked for particular signs only of memory, judgment and imagination; and he did not think, that the feelings also reside in the brain. Accordingly, not at all succeeding by this method, he abandoned all the notions of philosophy, and compared the form and

size of the whole head with the favourite occupations of each individual. It is generally known that certain persons are naturally endowed with particular faculties. Some are from birth fit for mechanics, or for music, for painting, &c. Gall accordingly compared individuals who excelled in any one kind of functions, and examined the whole form of their heads; he consequently for some time believed that great mechanics may be distinguished by a face enclosed between two parallel lines, that is, equally wide at the forehead and at the jaw-bones; and that the forehead of great musicians is triangular. He met however with exceptions; and was consequently aware that he had not yet found the truth; for nature makes no exceptions in her laws. If the eye be the organ of sight, vision can never exist without the eye; and it is the same with the internal organs. If any faculty be attached to a particular organ, this organ can never be wanting if the faculty manifest itself. This truth is indeed as evident as that which states that no effect can take place without a cause. Gall was therefore obliged to give up his former method of investigating the general configuration of the head, to which he had devoted

himself during several years. He has remarked, however, that this kind of observation was not entirely useless for him, because he acquired from it a habit of distinguishing the slightest differences of configuration.

Bearing then in mind his first observations, in which he distinguished a good memory by the developement of a particular part of the brain, *viz.* by prominent eyes; Gall sought to discover particular organs only by comparing them with the natural vocations of different persons: that is when, for instance, he observed any mechanician, musician, sculptor, draughtsman, or mathematician, endowed with his peculiar faculty from birth, he examined their heads in order to discover a corresponding developement of some cerebral part. In this way, he, in a short time, discovered in musicians and mechanics the developement of particular parts. He indeed observed that the respective organ is always highly developed, when the same great talents are innate, while the rest of the head presents very different shapes in different individuals. At first he confined his observations to men of partial genius; and such individuals were indeed most proper, not only because their organs are easily

pointed out, but also because these persons alone resist the influence of external circumstances and of education. These individuals are also the most proper for establishing the organs and giving conviction to beginners; for in them the organs are most easily distinguished, and the relation between the developement of the cerebral parts and the particular manifestations of the mind is most evident. It is also important to observe the characters of persons who being uncultivated are consequently least capable of dissimulation. Being physician to the Establishment for the Deaf and Dumb at Vienna, Gall was for this purpose fortunately circumstanced; he could observe the natural state of their manifestations, and their different degrees of susceptibility of education. With this view, he also called into his house common persons from the lower classes, and excited them to such conversation and behaviour as might make him acquainted with their characters.

Gall then investigated particular organs according to the principal actions of men, and he named the organs according to these actions. He observed, for instance, individuals who were born mathematicians, me-

chanicians, musicians, philologists, metaphysicians, poets &c., and if he found a certain part of their brain uniformly more developed than the rest, he termed these cerebral parts, the organs of mathematics, music, philology, metaphysics, poetry &c. In the same way, did he observe individuals who from birth were stubborn, proud, courageous, thieves, murderers, religious &c., and if he found the size of some cerebral part correspond with the degree of these actions, he called these parts of the brain, the organs of pride, firmness, courage, theft, murder, religion &c. Being unacquainted with the special faculties, Gall could proceed in no other way; and he erred only in not suspending the denomination of the organs. He was obliged to observe man only in action; but as the actions of man and animals are seldom the result of one single faculty, and as many actions result from an abuse of the faculties, it may easily be conceived that the nomenclature, established by Gall, was very defective. It is true that in individuals who, for instance, have stolen from infancy, notwithstanding the most careful education, and the severest punishment, one part of the brain is particularly developed; but all persons in whom this organ

is much developed are not therefore thieves. It is the same with the organ of murder: those who from infancy have a propensity to murder, present one part of the brain highly developed, but all persons who have this organ thus developed have not therefore murdered.

It is indeed evident that no organ should be named according to the abuse of its faculty. Greediness and drunkenness depend on a certain organization, but it is not therefore said that there are organs of drunkenness and greediness. Such also is the case as to organs of theft and murder: these functions are abuses which result from the highest degree of activity of certain organs, when not directed by other faculties. Hence Gall, who distinguished the organs only when they were extremely developed, while the other organs were very small, observed a certain organization in inveterate thieves. This will indeed always be the case, and Gall, as mentioned above, was wrong only in naming this organ according to its abuse. Moreover Gall, in his mode of proceeding, has observed only the particular actions which accompany the different organs, but has not determined their special faculties. Hence

his complaint in respect to every organ, that he does not know its sphere of activity. His mode of observation, however, was necessary, and has prepared the way for several philosophical considerations, which elucidate this doctrine and render it conformable to all other physical and moral truths.

There must be some relation between the structure and functions of organic parts; hence in examining the functions of the brain, it was natural to think of its structure; especially as physiological and pathological observations evidently show that the structure of the brain must be quite different from what it is supposed to be. A woman with a considerable dropsy of the brain, who manifested a moderate understanding like other women of her class, died at fifty-four years of age, of an intestinal inflammation, and the cavities of her brain contained nearly four pints of limpid water. Many similar facts are known: now, either the brain is the organ of the mind, and in this case it cannot be destroyed in hydrocephalic persons who manifest intellectual faculties, or the brain is not the organ of the soul, because hydrocephalic persons, whose brain is disorganised, nevertheless manifest intellectual faculties.—Inju-

ries of the head influence sometimes the opposite side, and sometimes the same side of the body. These and many other facts cannot be explained until we are better acquainted with the structure of the brain. It was, therefore, natural to examine also the structure of the brain. Moreover the anatomy and physiology of the brain are intimately connected with the structure and the functions of the five senses; and thus successively we have extended our inquiries to the anatomy and physiology of the whole nervous system.

As in man and in more perfect animals, the manifestations of all the faculties are more or less subordinate to the influence of the nervous system, it cannot be doubted that such inquiries are of the highest importance, and interesting to all branches of science. Even the functions of organic life, as digestion, circulation, respiration, nutrition, secretion, and excretion are deranged or annihilated when the nerves which co-operate in the performance of these functions are compressed, wounded or destroyed. The nerves distributed to the organs of sense and to the muscles are indispensable to the performance of their functions. We also prove, by

incontestable facts, that all the instincts, propensities, sentiments and intellectual faculties, all affections and passions, all the characteristics of humanity are manifested only by means of the nervous system. Hence studying the nervous system, we first contribute to elucidate anatomy and physiology; and as it is impossible to understand any derangement of the functions if we are not acquainted with their regular state, our investigations are intimately connected with medicine, especially in respect to the derangement of the mind. Moreover, they rectify the philosophical considerations concerning the primitive faculties of the mind, their origin and the conditions necessary to their manifestations. Finally, as all institutions, without being calculated on a knowledge of human nature, cannot be permanent; we are obliged to consider man in all these branches, and to combine our observations with all professions. Thus, the whole of our inquiries is the knowledge of human nature, as far as it appears in the healthy and diseased state.

It evidently results how incorrect the name *craniology* is. Our doctrine in general concerns the knowledge of man—anthropology

—and the physiognomical part in particular examines the organs of the mind—organology—and the activity of the faculties—pathognomy.—Thus, our doctrine has begun with single observations; these have been multiplied, and are still repeated as many times as possible. From the combinations of these observations inferences have been drawn, and principles established, and these ascertained again by new experiments; hence, its object is the knowledge of human nature, and we found our opinions on observation and induction.

CHAPTER II.

MEANS OF POINTING OUT THE ORGANS OF THE
MIND.

THE greater number of natural philosophers, being convinced that the brain is the organ of the soul, have concluded that its functions must be proportionate to its size. Modern discoveries, however, have shown that the brains of whales and elephants are larger than that of man. In the same way, the brains of the monkey and the dog are smaller than those of the ox, ass, and hog, yet the former come more nearly to man in respect to their intellectual faculties. Anatomists, therefore, no longer said, that man had *absolutely* the largest brain, but only that he had the largest brain *in proportion* to his body. This conclusion, however, was drawn too hastily, since the sparrow, canary-bird, linnet, red-breast, bulfinch, and several species of monkeys have in proportion to their body more brain than man.

In order to measure the extent of the brain and, as he imagined, the corresponding energy of the intellectual faculties, Camper

drew a vertical line touching the upper lip and the most prominent point of the forehead; and also a horizontal line crossing the former, and touching the tips of the upper front teeth and the external opening of the ear, or at least corresponding to these points in its direction. Camper thought that man and animals have more understanding, the more the upper and inner angle formed by the two lines, or that including the upper jaw, nose &c. is obtuse; and on the contrary, that man and animals are more stupid, the more this facial angle is acute. Lavater, Cuvier, Richerand, and a great number of anatomists and physiologists, approve of this facial angle. According to it, Lavater composed the progressive scale of heads from the frog to the Apollo Belvidere. Cuvier also composed different tables, which indicate the facial angles of men and different animals; and he fixed, for the facial angle of Europeans, in a child ninety degrees, in an adult person eighty-five, and in an old decrepid man fifty degrees. This manner however, of measuring the intellectual faculties is not more correct than those I have previously mentioned. The facial angle applies only to the anterior parts of the brain situated in the forehead, and

is inapplicable to all the lateral and posterior parts: hence the facial angle could, even if there were no other objection, indicate only those faculties whose organs constitute the forehead. Besides, it is entirely impossible to determine in a general way the proportion of the forehead to the face: in new-born children the forehead is flat; but in children from three months to eight or ten years of age, the forehead is ordinarily prominent, and forms a more obtuse angle than it does either in new-born children, or in adult persons. Hence Cuvier is wrong in admitting that the facial angle decreases in proportion as the child advances in age. Even, however, if this were the case, it would be possible only to say that the facial angle will be of so many degrees in grown-up and in old persons, when it was such or such in infancy. It is utterly impossible to draw a conclusion from one individual; for among a hundred persons not two present the same facial angle. Yet according to the supposition of Cuvier, all children, all grown-up, and all old Europeans, ought to have the same proportion of the cerebral mass to the face. We know of negroes whose jaw-bones are extremely prominent, but who manifest great intellectual

faculties, because their foreheads are much developed. According to their facial angle, they ought to come after many stupid Europeans who have a small forehead, but whose jaw-bones are inclined backward. From all these considerations then it follows that the facial angle cannot serve as a means of measuring the moral sentiments and intellectual faculties.

The cerebral parts have also been compared with each other, in order to ascertain their functions. Cuvier accordingly says * that it is possible to determine the exact proportion of the brain to the cerebellum; because no change of health produces any influence upon the cerebral mass; and he has composed several tables relative to this object. He there admits the proportion of the cerebellum to the brain, to be in man as one to nine, in the *Saimiri* as one to fourteen, in the ox as one to nine &c. Now even these few examples prove that the intellectual faculties cannot be measured according to the proportion of the cerebellum to the brain; for, by this hypothesis, man and the ox must belong precisely to the same order. If also, according to the opinion

* *Anat. Comp.* tom. ii. p. 152.

of Malacarne, the cerebellum were the organ of understanding, the Saïmiri ought to have more of this faculty than man; if according to our doctrine the brain be the organ of the feelings and intellectual faculties, the Saïmiri ought to have less of these than the ox; and if the hypothesis of Cuvier were true, the ox should have as much intelligence as man has.

Many natural philosophers have expected to succeed in pointing out the organs of the intellectual faculties by means of the anatomy of the human brain in particular, or at all events by comparative anatomy in general. It is also pretty generally believed that our new physiology of the brain is the result of its anatomy. I shall here, therefore, make some reflexions on human anatomy in particular, and on comparative anatomy in general. There are, then, very few cases where the structure of any part indicates its function; and the opinion that this is the case is never more than conjectural. When I say, however, that the function of any part is not discovered by a knowledge of its anatomical structure, I am far from maintaining that the structure of any part has no relation to its function. The structure of the heart

indeed has not shown its function, yet its structure is still in relation to its function; and it is the same with all the parts of automatic and animal life. A physiological system of the brain would be necessarily false, were it in contradiction to its anatomical structure. If an anatomist can prove that all nerves are only prolongations of the brain; that they terminate at one central point; that there is no difference between the brains of different animals though their faculties are different; that all parts of the brain increase and decrease simultaneously; that there is no difference between the brain of an idiot from birth, and that of a person endowed with great talent: in one word, if an anatomist demonstrate that the structure of the brain is in contradiction to physiological principles, or *vice versâ*, he will undermine and annihilate our whole doctrine with all its consequences. Thus there is some relation between the structure and function of organic parts; yet the structure of any part seldom indicates its function.

Let us now examine whether comparative anatomy can determine the functions of the brain. At first sight, it seems that comparative anatomy ought to afford import-

ant results; but there are, in this respect, obstacles which it is impossible to overcome. Of these the first is, as I have just said, that it is impossible to determine the functions according to the structure of any part. Moreover, there is a great number of animals whose automatic life presents several organs of which man is entirely destitute; and we may conjecture that it is the same with animal life: but how can we conceive any function if we are not endowed with a similar faculty? Accordingly although it is of the highest importance to know the gradation observed by nature in perfecting the brains of animals in order to multiply and ennoble their functions, we must allow that, notwithstanding the most assiduous labour, comparative anatomy has shown only the mechanical form of different brains, but that these anatomical notions do not at all determine the functions of the cerebral parts.

Several natural philosophers have endeavoured to determine the functions of the brain by its mutilations. They therefore cut away various parts in order to see what faculty should be lost. But, in the first place, these means could not be accurately employed, and must therefore be entirely useless. They

could not be accurately employed, and were imperfect, because the duplicity of the organs was overlooked. The structure, also, of the brain was unknown; and therefore the mutilations were made horizontally, while the direction of the fibres was vertical. Moreover, the special faculties of the mind were unknown, and the mutilated animals were said to manifest all faculties, if they manifested the common and general faculties.

These means were not only altogether useless under such circumstances, but they can, at no time, serve to determine the functions of the brain; for the organs are not confined to the surface: consequently every organ ought to be cut away, on both sides, from the surface to the medulla oblongata; and such a wound would kill any perfect animal. Let us, however, even suppose that the animal could survive such mutilations: how should it manifest a sensation of which it has been deprived? and how should it indicate the want of this sensation? Moreover, such operations are too violent, and the animals might retain several faculties without the power of manifesting them: a bird whose brain is in any way violently injured is not likely to sing, or to build a nest &c. Finally, the de-

rangements of parts, which are affected by sympathy, are sometimes more sensible than those of parts which suffer primitively or idiopathically. A head-ach is often the sole result of something indigestible in the stomach ; and this takes place without any feeling of pain in the stomach itself. Hence it is impossible to determine the functions of the cerebral parts by their mutilation.

OUR MANNER OF DETERMINING THE FUNCTIONS OF THE BRAIN.

In every function, we may distinguish its energy or quantity, and its modification or quality. It is very difficult to examine the modifications ; but more easy to distinguish the different energy of the functions. Let us then examine on what conditions the energy of the functions of the brain depend. There is a general law that the energy of the functions of any organic part depends on its size and on its organic constitution, that is, on its extensity and intensity. It is also certain that in order to judge of the degree of activity of the faculties, it is necessary to consider, besides the extensity and intensity of the organ, the exercise of every faculty,

and the mutual influence of the faculties upon each other. Now among these conditions, the most easy to be observed is the size of the organs. As, then, the energy of functions depends on the size of their organs, and as the size of the organs is most easily distinguished, it results that these means are the most proper for the discovery of the functions of the brain.

There is indeed throughout all nature a general law, that the properties of bodies act with an energy proportionate to their size. Thus a large loadstone attracts a greater mass of iron than a small one of a similar kind; the fermentation of the same fluid is more energetic if its quantity be more considerable; and a great muscle of the same kind is stronger than a small one. If the nerves of the five external senses be larger on one side of the body, the functions also are stronger on that side. Why should it not be the same in respect to the brain? Those persons, however who assert that we neglect the internal organization are entirely wrong.

In order to judge exactly of our mode of proceeding, it must be considered that we do not endeavour to determine every degree of activity of any cerebral part, but only the

nature of its functions; and to this end its size is sufficient. Gall, though he mentioned this difference in his lectures, was not careful enough to insist on it. The internal constitution, though very important, is not easily distinguished; yet on account of its influence, we never compare the individuals of different kinds, not even those of the same species; but, in order to obtain the first notion of any organ, we confine our observations to each individual independently of others. I admit even the possibility that, in the same individual, the internal constitution of the different parts of the brain may vary in the same way as the optic nerve may be more irritable than the auditory or the olfactory. It may, nevertheless be observed that a great difference in the size of the cerebral parts produces a difference in the manifestations of the mind. Indeed the divers parts of the brain are differently developed: one is larger, another smaller; and, according to a general law, we are convinced that the functions of the parts, which are much developed, manifest themselves with more energy, while smaller organs are correspondingly less active.

There now arises the question whether it is possible, during life, to distinguish the

development of the cerebral parts in man and animals? The question, Is it possible to know the size of the cerebral parts by the form and size of the head? must be distinguished from another question, namely, What is the cause of the form and size of the head? This latter is important in respect to physiology in general, but it is indifferent in respect to the practical part of the organology of the brain, which requires only the possibility of knowing the size of the cerebral parts without examining the causes of their development. To the first question we must answer, that there is, in this respect, a great difference between different kinds of animals; that it is impossible to compare animals with animals, or animals with man; that it is even necessary in animals and in man, to consider the different periods of life; that in mankind in particular it is sometimes possible to determine the organs of the brain with exactness and facility; that several other circumstances render it difficult; and, finally, that in certain cases it is impossible. Let us therefore first enter into the examination of the cause which produces the form of the head.

CAUSE OF THE FORM AND SIZE OF THE HEAD.

I here speak only of mankind, but these researches, with regard to both the preceding questions, may be extended to every kind of animals. It is asked by some, whether it is the skull or the brain which determines the form of the head? and it may seem that the skull, which is hard, must determine the form of the brain, which is soft, rather than the brain that of the skull. In order to illustrate this question, I shall consider man both in his healthy and diseased state. The brain exists before it is confined by the skull. It is both then and subsequently covered by a fourfold membraneous coat: the pia mater, which closely adheres to the substance of the brain; the tunica arachnoides or arachnoid coat, which has this name from the extreme tenuity of its texture; the dura mater, which consists of two separable membranes; and a cartilaginous membrane in which ossification takes place. This fourfold membraneous coat, enveloping the brain, exactly represents its external form.

The ossification begins at different parts, called points of ossification; and from these

the ossification extends in a radiant direction according to the size and form of the cerebral parts to which it adapts itself. The elongations of the bony radiations are sooner or later aggregated, and constitute the individual bones, of which the regular and connected assemblage forms the skull. In newborn children, there are commonly eight bones, which contain the brain and represent its form and size: these bones are—two frontal, which latter commonly unite and form one bone, yet there are grown-up persons whose frontal bone is divided; two parietal, two temporal, one sphenoidal, one occipital, and one ethmoidal bone. These various bones have connexions called sutures or articulations; and when combined by them, they form the skull. The bones are, till this age, very thin, and most perfectly accommodated to the form and size of the cerebral parts. It may here be asked, whether any difference of brain and skull is already perceptible in the foetus? Soemmerring has elucidated this subject; we have repeated the same observations; and it is indubitable that the heads of foetus are as different as those of grown-up persons.

Then happens birth; and it must now be

ascertained whether the form of the heads of new-born children is changed by it; and it may also be inquired, whether it is possible for a midwife or accoucheur to give to the head an arbitrary form, by compressing it or by impressing certain parts of it? Nature has taken particular care of the preservation of the brain enclosed in the cavity of the cranium: the dura mater, which envelopes the brain, is attached to the skull more firmly than in adults, and prevents the bones from riding over each other. The prolongations of the dura mater, known under the names falciform process, and tentorium, contribute equally to secure the parts of the brain. The bones themselves are flexible, elastic, and articulated in their connexions. Moreover, the skull forms an arch, and this form offers the greatest resistance. The brain is also a living part, and its natural elasticity is supported by its continual elevation and falling, produced by the circulation. The tumours which are commonly observed in the top of the heads of new-born children result from the accumulation of blood, the circulation of which is interrupted; but after a few hours or days the humours are absorbed, and the tumour disappears. Consequently, a tran-

sient pressure, which does not act very violently, does not change the primitive form of the brain. A violent compression will derange the organization: a less violent but permanent compression, which changes the natural form of the brain, and hinders its developement, will always do harm to the manifestations of the mind. If such individuals do not become idiots, the manifestations of their faculties are at least deteriorated. Thus in new-born children the size and form of the head depend on the brain.

By degrees the skull grows hard. It may therefore be asked, whether the hard skull must yield to the soft brain? If we compare the skull of a child with the skull of an adult person, it is obvious that the skull of the adult is larger than that of the child, consequently, the skull increases in proportion to the brain. Moreover, all the cerebral parts do not increase simultaneously; and this partial developement is equally observed in the skull. The forehead, for instance, which at birth is narrow and flat, grows wider and prominent from the age of three months, to that of eight or ten years. After this period, the middle part of the forehead is in proportion to the other parts

less developed. Such is the case with all other cerebral parts which increase successively.

Some explain the growth of the skull by the action of the brain in a mechanical way. This explanation however is quite incorrect; for if the brain were exposed to the least compression, its functions would be deranged. The phenomena of growth results from the change which our body, as well as every organic being, unceasingly undergoes. The parts of our body are continually decomposed and composed again; the matter which constitutes our body being evacuated by exertions, and replaced by other matter, furnished by alimentation. Like all other parts of our body, the brain and skull are submitted to this decomposition and composition; and according to the natural law established between the skull and brain, the brain at all ages commands the directions, in which the bony mass is deposited in order to form the skull. If the whole brain or some parts increase or decrease, the ossification of the skull follows always the size and form of the brain.

Let us now consider that which, in old age, happens with the brain and skull. Then

the cerebral parts diminish by degrees; the convolutions which are plump and well nourished in young persons sink down and diminish in size, and they are no longer near to each other. In the same proportion as the brain or its parts decrease, is the internal table of the skull changed, according to the law of nutrition of which I have just been speaking. Ordinarily, however, the external table of the skull preserves in old age the same size and form which it had at the age of maturity. At that period, therefore, the skull, if the brain diminish in size, becomes thicker; and the two tables are sometimes very distant one from the other. From this exposition of ages it results, that from the beginning of ossification till death the internal table of the skull is moulded according to the brain; and that in old and decrepid age the two tables are often separated, and the skull is thicker than it was at the age of maturity.

The diseased state of the brain also proves our assertion relative to the form of the skull. There is no skull without brain; for if monsters be born without brain, their skull also is wanting. If in idiots from birth the brain be hindered from increasing, the

skull remains small; and if, on the contrary, the brain be distended by water accumulated in its cavities, the skull participates in this extension, whether it be general, or exist only in particular places. The resistance of the brain is also demonstrated by wounds of the skull, wherein bits of bone depressed by external violence are replaced by the action of the brain. Moreover, this resistance of the brain is proved by fungus of the dura mater; for fungous tumours act upon the skull, destroy and pierce it. All therefore concurs to prove that the form and size of the brain regulates the form and size of the skull. I do not, however, deny that in some diseases of the skull, the ossification may be primitively altered, and the developement of the brain injured by the influence of the skull; but in such cases the functions of the brain are unavoidably deranged.

Thus from all these considerations with regard to the skull, it results that its form is the result of the form of the brain. Let us now examine the circumstances wherein we may certainly and easily distinguish the size of the cerebral parts. I shall afterwards mention various difficulties which must be

removed; and, finally, consider the cases wherein it is impossible to determine exactly the size of the brain and its parts.

POSSIBILITY OF DISTINGUISHING THE SIZE OF
THE BRAIN.

I have already mentioned that in order to promote the practical part of the physiology of the brain, a knowledge of the cause of the size and form of the head is not essential; and that, in this respect, it is only necessary to distinguish the size of the brain, and its particular parts, by the exterior of the head. This *knowledge* requires a precise idea of the difference between the size of the head and that of the skull. Now all the dimensions of the skull are much smaller than those of the head, but in its details the whole shape of the head is preserved. It is with such a restriction only that we can make use of antique busts and heads; for it is certain that the antiques, being colossal, do not present the natural size of the head. It is, nevertheless, remarkable that their form and size are very different: what difference, for instance, between the heads of women and men; between the heads of gladiators,

sacrificators, philosophers, great poets and generals?

In respect to the size and form of the head, it is also necessary to know the common size of heads, whether in general or in their different regions, in order to distinguish at the first view whether any head is too large, or too small. It is also necessary not to confound bony excrescences and irregular elevations with those protuberances which express the developement of the organs. Moreover, it is necessary to know those less important bony protuberances which have particular destinations, as the mastoid process behind the ears, the spina cruciata of the occiput, the zygomatic process before the ear, &c.

It is from experience perfectly certain that the skin, muscles, and coverings of the head in general, do not prevent us from distinguishing the form of the skull; and that the dimensions of the skull are only smaller than those of the head. Still it is to be examined whether the size and form of the skull indicate those of the brain? To this end I repeat, that the skull is composed of two tables, one external and the other internal; and that between these two tables a cellular spongy

mass, called diploe, is deposited. These two tables are scarcely perceptible in children, but are distinct in adults, though their distance from each other is not very considerable. In general, from birth till the period when the brain begins to diminish in size, it is not only possible but easy to determine the size of the brain by examining that of the skull; for there never is any empty space between the skull and the brain, and the two tables are not sufficiently distant in any way to invalidate our assertion.

It is to be considered that we only intend to distinguish the size of organs, and that it is essential not to confound this idea with that of protuberances; or rather it is necessary to bear in mind their relations to each other. If indeed one organ be much developed, and the neighbouring organs be proportionally developed, then no protuberance can be perceived, and the surface is smooth. Now this may happen whether the organs are much or little developed. Moreover, every individual has all the organs; and it is only to be determined whether the whole brain, or one or more parts, are more or less developed.

Finally, it is to be considered that the

development of the organs is different in respect to their length, and in respect to their breadth; for the fibres which compose the organs are sometimes thick and short, sometimes thick and long, sometimes slender and long, and sometimes slender and short. This difference of development must produce some difference of the manifestations of the faculties. My observations are not yet matured enough to determine this point. It seems that long fibres produce more activity, and large fibres more intensity? It follows that the size of the brain in general, and of its parts in particular, may be determined from infancy to the commencement of decrease, consequently at the ages in which the faculties are the most active. Let us now consider the difficulties which must be removed in the physiology of the brain.

DIFFICULTIES OF DISTINGUISHING THE SIZE OF CERTAIN PARTS OF THE BRAIN.

Plattner, of Leipzig, said, that it is impossible to determine the organs situated in the middle line of the head, on account of the longitudinal sinus. But this receptacle of blood, or this canal, is not large enough

to hinder us from distinguishing the size and developement of the neighbouring organs, the elevations of the organs being much larger. Sometimes the hemispheres of the brain are a little separated in the middle line along the longitudinal sinus; this happens most commonly between the organs of philoprogeny, of self-esteem, and of perseverance. Then there is a groove on the outside of the head; but he who knows organology cannot be mistaken.

Those who begin to practise our doctrine find another difficulty in the frontal sinus. Many adversaries even maintain that it is impossible to distinguish the developement of the cerebral parts situated behind it. They say that on account of the frontal sinuses, the organ of locality cannot be distinguished. The developement of this organ, however, and the frontal sinuses, present quite different forms: the frontal sinuses only form a bony crest; and the isolated protuberance, which indicates the particular developement of the organ of locality, is round and large. Sometimes the organ of locality is very considerable, and at the same time there are frontal sinuses; then the bony crest

is perceived, and at the same time this part of the forehead is prominent.

The cerebral parts, situated behind the orbits, require some exercise on the part of the organoscope, in order to be exactly determined. Their developement is perceived by the configuration and position of the eyes, and by the circumference of the orbits. It is therefore necessary to examine whether the eyeball is prominent or hidden in the orbit, whether it is depressed or pushed sideward, inward, or outward. According to this position of the eyeball, we may judge that such or such part of the brain, which is situated against such or such part of the orbit, is more or less developed.

The greatest difficulty for beginners is, when any organ is extremely developed, and pushes the neighbouring organs out of the places which they commonly occupy. There are two cases of this kind. Either one single organ is extremely developed, or several are very voluminous, but in such a proportion that the surface is almost smooth. In the first case the difficulty is not very great, for every organ has its own form and its particular direction. Therefore it is only

necessary to look at the most prominent point which is corresponding to the midst of every organ. It requires more exercise if several neighbouring organs are almost equally developed. However the most prominent point, and the direction of the protuberance, facilitate our examination and decision.

It is objected against organology, that though it be possible to measure the form and size of the brain according to the form and size of the head, it is impossible to determine the size of the organs according to the size of the head or skull, because the organs are not confined to the surface, or to the convolutions of the brain. It is true the organs are not confined to the surface of the brain; they extend from the surface to the great swelling of the occipital hole, (medulla oblongata,) and probably to the commissures; for the whole mass of the brain constitutes the organs: but as the peripheric expansions of the five senses indicate the developement of the respective nerves, so the convolutions of the brain denote a larger or smaller developement of the whole cerebral mass. This will be understood by analogy. Animals which have a large external apparatus of smell, large

nostrils, large turbinated bones, a large expansion of the pituitary membrane, consequently a very considerable nervous expansion, have the whole olfactory nerve very much developed; and it is possible to measure the developement of the nerve in general according to its peripheric expansion. In the same manner the retina, or the expansion of the optic nerve, is in proportion to the nerve itself; and it is the same with the organs of the moral sentiments and intellectual faculties. The convolutions are the peripheric expansions of the internal nervous bundles, and they are in proportion to them, so that it is possible to determine the whole mass of the organs according to the convolutions. Therefore though the organs are not confined to the surface of the brain, and though only their peripheric expansions are perceived at the surface, it is however possible to determine the size of the whole organs.

IMPOSSIBILITY OF DETERMINING THE SIZE OF THE BRAIN.

It remains still to speak of the cases wherein it is impossible to determine the size of the brain in general, and of its parts in parti-

cular, according to the form and size of the head. If the brain begin to diminish it is impossible to determine its size. According to a general law of organic parts the brain decreases by degrees, the convolutions which, at the age of maturity, were plump and prominent, sink down, and are separated from the other; in one word, the composition is no longer equal to the decomposition, the latter prevails, and the size of the brain diminishes. Then often the external form and size of the head remain the same, but the internal table of the skull follows the surface of the brain, and both tables are more or less distant one from another, and separated by the diploe. In this manner the skull of old decrepid persons of both sexes is commonly thicker, more spongy, and less dense. The diploe is not only more considerable, but the tables are also less solid. Sometimes there are, in the skulls of old persons, parts which are very thin, while the rest remains thick; sometimes the whole skull grows thin. This is evidently the consequence of the decomposition or absorption not being always equally strong at all places of the brain: its effects, however, are most commonly observed in the middle of the parietal bones. It may be

remarked that the least blow may depress such thin skulls of old persons, while a much stronger blow would not have done to them the least harm at the age of maturity. Thus old and decrepid persons do not serve to confirm the doctrine of the organology, because it is in them impossible to judge accurately of the size of the brain from the size of the head. Moreover, the organs do not continue to be very active at this age. It is therefore evident that, in order to establish the physiology of the brain, we must confine our observations to young and grown-up persons in the flower of their age.

Another circumstance which impedes our determining the size of the brain, according to the size and form of the head, is, that which occurs in certain cases of chronic insanity. In this state, the brain diminishes in size as the other nerves do when long diseased: the internal table follows the size of the brain, while the external table preserves its usual position; and on this account the skulls of fools and madmen are often very thick; yet their texture is not very spongy, but hard and dense like ivory. It is indeed remarkable that a great number of madmen have the skull hard and dense like

ivory, and extremely heavy. The skulls of many madmen are also thicker than usual, and even when they are not thicker, they are at least dense and heavy. This phenomenon is probably an effect of some alteration in the brain, and it furnishes a new proof of the influence of the brain upon the skull.

It would be very interesting to note those madmen whose skulls are dense, and those whose skulls are not so, or whose skulls are dense and thick, &c. It would seem that the inflammatory state of the blood-vessels of the dura mater contributes to the density of the skull. Does the greater afflux of blood towards the skull augment the ossification? In idiots from birth, who live long, the skull is often thicker, but less dense than in furious madmen. It is a well known fact, that at the union of fractured bones, the ossification is more solid than at other parts. We have also seen several skulls which, being injured, had suffered from inflammation, and which were thicker or at least denser and heavier than natural. Gall preserves in his collection the skull of a soldier who at the battle of Ozakow had received some severe blows with the but end of a gun: he became mad in consequence of them, and lived in

that state during thirty years; his skull is like ivory. A stone fell upon the head of a person, and deranged his mind; the person died a long time after; and his skull is dense and heavy.

This observation, relative to the density and thickness of the skulls of madmen, is disputed. We, however, support our assertion by experience. I find also similar skulls in various cabinets, but it is seldom that the proprietors are acquainted with the history of those to whom these skulls belonged. There however were anatomists and natural philosophers who before us made the same observation. Greding, at Waldheim in Saxony, has opened several hundreds of skulls of madmen, and he found that the greater number of their skulls was thick and dense. We have ourselves opened a great number, and among them many who died at the Salpêtrière and in the Bicêtre: we found their skulls dense and often thick. Dr. Goergen, at Vienna, has also in his collection many skulls of this kind. Thus it is indubitable that the skulls of many mad persons are dense and thick.

We have also observed that the skulls of individuals, who for a long time had a pro-

pensity to suicide, are commonly dense, and sometimes thick. Here, however, it is necessary to distinguish those who kill themselves in a fit of momentary despair, or from a short melancholy, or from this disease in particular; for it is impossible that the state of the ossification should be changed in a few days. These researches relative to the skulls of alienated persons, though important in physiology and pathology in general, and immediately connected with organology, are not essential to it in as far as we intend to determine the functions of the brain. We even admit that in those individuals, who are long diseased, it is impossible to measure exactly the size of the brain according to the shape and size of the head.

Let me now state the means which are fit for determining the organs of the manifestations of the mind. Gall compared all energetic actions with the greatest developement of any part of the brain; and when he found that a greater developement of any cerebral part corresponded with any given energetic action, he supposed that this part of the brain might be the related organ. The probability then increased in the same proportion as the number of observations was multiplied.

Moreover, if the head of any individual presented any protuberance, which was evidently the result of cerebral developement, Gall endeavoured to be acquainted with the talents or the dominant character of the person. If it were an organ which he had previously determined according to the actions of others, and if the actions or inclinations of this person were still concordant, the probability increased. If it was a new organ, he compared in other individuals similar actions or inclinations with the developement of the respective part of the brain; and concluded accordingly. In these two ways did he determine all the organs he discovered: thus, he pointed out those which he called the organs of propagation, murder, theft, mechanical arts, music, mathematics, and metaphysics, by determining the organs according to the energy of the actions; and he discovered the organs of philoprogeny, circumspection and religion, by determining the actions according to the protuberances.

Now, if energetic actions are at once produced and indicated by large organs, it unavoidably follows that weak actions are at once produced and indicated by small organs. On this account, Gall compared the weak

functions of individuals who were almost destitute of particular faculties with the respective organs, and weak organs with the respective actions : and if weak actions were found to correspond to small organs, or small organs to weak actions, these proofs in a negative way confirmed the first conclusion. Many circumstances have contributed to multiply these positive and negative proofs. For this purpose, it is necessary to live in large towns, and to frequent every class of society. Gall accordingly was professionally acquainted with many families ; and being physician to the director of the schools at Vienna, he had an opportunity of examining every child who excelled ; while, having himself no children, he was not obliged to spare expense for their sake. He was also bold enough to address every person in whose head he observed any distinct protuberance. In our travels, therefore, we have been able to obtain much information ; to observe many distinguished persons, and to compare their organization with their faculties ; in one word, to collect innumerable facts by our visits to establishments for education, to hospitals for idiots and madmen ; to houses of correction and to

prisons, and by our intercourse with different nations and with all classes of society.

It is known that, in general, physical truths improve in proportion as observations are repeated. We continue therefore to multiply our observations; and as in respect to several organs the number of these observations is immense, we consider the respective organs as established. With regard to them we must therefore insist on our opinion so long as from experience we are not convinced of the contrary. Several organs however are still only probable, and others merely conjectural, requiring a greater number of observations in order to be determined with the same degree of certitude as those which are supported by the most satisfactory proofs. It is however objected that the organs cannot be verified, because our conclusions are drawn only from individual facts. But is not this the case with every physical truth? No physician has observed every fact; no anatomist has seen the viscera of every one. Yet in consequence of the stability of natural laws, physical truths are admitted, and the position and structure of the viscera are supposed to be the same in individuals who have

not been opened as in those who have. It has also been objected that our observations may be true only in one country; and that it is necessary to repeat them elsewhere. Our travels have refuted this objection, because we have every where had opportunities enough of multiplying and confirming the same observations.

Gall soon felt the necessity of making a collection of casts of individuals remarkable for any quality, whether talent or moral sentiment. Having therefore depressed and flattened the hair, he modelled them in plaster, and imitated as exactly as possible the whole configuration of their heads. By these means he was enabled to multiply and to rectify his observations; he could compare at the same time different individuals endowed with similar faculties; and he could examine them at leisure, which was a very important circumstance; for our mind does not act always with the same energy and acuteness. Gall allows that he often placed together the busts of individuals who excelled in the same functions without distinguishing any difference in the shape of their heads; sometimes he looked in vain at them for several weeks; and sometimes he was able to point out an

organ without previously thinking of it. Those who have not engaged in similar studies may have some difficulty in conceiving this assertion; but those who have made similar observations know how long it is necessary to exercise the eyes in order to perceive every difference of form and size. The collection of busts procured still another advantage. Many of these individuals were remarkable in several points of view, whether in an affirmative or negative manner; and they therefore presented various points of comparison. Gall at the same time made a collection of skulls, especially of those persons who were remarkable for any particular quality, and if possible of those whose busts he had modelled in plaster. In this manner, he learned to compare heads with skulls; and moreover could verify the forms of the organs.

As the arrangement and position of all parts which are common to man and animals are the same, it is very useful to compare with each other animals which are endowed with the same faculties, and also to compare them with animals which are destitute of these faculties. In this way the points of comparison become extremely numerous, and our

observations in respect to faculties common to man and animals, may be repeated to infinity. No organ however has been discovered in animals, but all were pointed out in man; and the reason of this is, that, in order to attain certainty, our observations must be confined to individuals of the same kind, and chiefly to individuals of talent. Some discoveries as to the physiology of the brain made on animals by agriculturists, countrymen, hunters, and jockeys, have been found in different individuals of the same kind. Peasants, for instance, know that horses with large foreheads are more docile than those with small foreheads; and therefore they put them at the head of the team. Some jockeys distinguish biting and stubborn horses by the configuration of the forehead. Now these persons made such observations as to the different forms of the head without knowing their basis, which really depends on the greater or smaller developement of the cerebral parts. Thus, the comparative anatomy and physiology of the brain may contribute greatly to determine the organs. Many animals, I may observe, are mutilated by nature, and it is not necessary to make them undergo violence in order to determine their

functions. In fine, comparative anatomy shows that in lower animals the brain is more simple, and in perfect animals more complex ; and, accordingly, it is observed that the faculties multiply in proportion as the parts of the brain are more numerous.

The anatomy of the brain in particular aids us in establishing the organs. First, the bundles which constitute the organs are distinct, and no central point is perceived. The plurality of the organs therefore is as evident as the plurality of the faculties. Moreover, some faculties have a great sphere of activity, while the actions of others are very weak ; and it is observed that the size of the respective organs is in direct proportion to these circumstances. It is known, for instance, that the moral sentiments act with greater energy than the intellectual faculties ; and anatomy exhibits to us a corresponding difference in the natural size of the respective organs. Anatomy shows also that the various cerebral parts are not simultaneously developed, in the same way as the manifestations of the mind are not at the same period called into action. In short, anatomy always corresponds to physiology, and *vice versâ*.

The diseased state of the brain and its accidental injuries may also be taken advantage of, in order to determine particular organs; but I have already observed that these kinds of observation are very uncertain. They are only secondary, and by no means decisive; yet are they interesting, when combined with other direct and evident proofs. In treating therefore of the particular organs I shall make such observations, without however maintaining that it is possible to point out the organs solely by them.

Mental alienations, chiefly partial insanities, monomania, and the state of idiotism, are much more conducive to this object than the accidental injuries of the brain. In idiots from birth, the whole brain is small or distended by water. In madmen with partial insanities, the respective organs are commonly more developed than the rest, and their external signs are easily perceived. It is conceivable that persons who manifest a certain sentiment or intellectual faculty with peculiar energy, show, in a state of greater irritation, this faculty in the highest degree. I never saw a fool by pride without a great developement of the organ of self-love; however it seems to me that very great deve-

lopement is not indispensably necessary to every partial insanity; for every part of our body in general, and of our brain in particular, may grow more irritable than the rest, and therefore the energy of every cerebral organ may also increase and produce partial insanity.

It is of great importance to consider the heads of different nations. Several anatomists and physiologists have endeavoured to point out the particular shape of the heads of different nations. Though all observations of this kind are very defective, they are yet rather for than against the physiology of the brain. The foreheads of negroes, for instance, are very narrow; their talents of music and mathematics are also in general very limited. The Chinese, who are fond of colours, have the arch of the eyebrows much vaulted, and we shall see that this is the sign of a greater developement of the organ of colouring. The manner of thinking and feeling of different nations may be compared with those of their organs which are the most developed. It is obvious that I here speak only of the greater number of individuals in every nation; and only of the general type of their heads: for the modifications are in all countries infi-

nite. Generally speaking, however, there are nations whose heads are longer or shorter, higher or lower, narrower or broader.

There is still another means of pointing out or of confirming the organs, namely, pathognomy. Every internal feeling is manifested outwardly by certain motions of the head, body and hands; and these external manifestations are the constant and inevitable result of the internal faculties. They are also essentially the same in all nations and at all times. I here mention only one principle relative to the seat of the organs; namely, that the motions are conformable to the seat of the organs. If, for instance, a faculty, the organ of which is situated in the posterior part of the brain be active, the general motions are backward; and if its organ be in the forehead, then the motions are forward.

By all these means which we continually employ in order to multiply our observations, every organ may be determined, and those which are merely indicated may be confirmed. The number of facts which we have thus collected is immense; but, it is impossible to quote the whole of them: I can speak only of their results on the general inductions from them. Moreover, no one can

attain personal or individual conviction before he has made the same observations. I can show only what is to be observed and how it is to be done; yet I shall never advance any thing that cannot be observed by every other person. We do not listen to any objection grounded upon reasoning alone, and destitute of all observation. One fact well observed is to us more decisive than a thousand metaphysical opinions. We accordingly flatter ourselves that every one who, without any prejudice, may take the trouble to repeat our observations, will be convinced of the solidity of these principles of the organology of the mind.

CHAPTER III.

PECULIAR ORGANS OF THE MIND.

THE functions, and accordingly the organs, of the mind may be divided into external and internal; the former consist of voluntary motion and the five senses; the latter concern the brain.

EXTERNAL SENSES.

The external senses permit to men and animals a communication with the beings around them: it is by the medium of the senses, that they acquire a determinate consciousness of the external world. Without these senses, men and animals would have only an *internal* existence; but not, as Richerand says, a mere *vegetative* existence. What then can interest man more than his senses, to which he owes so many sensations, so many enjoyments? Hence the assiduous investigations of this subject by philosophers, physiologists and anatomists. Yet, not only the structure of the five senses, but also their functions, are far from being perfectly and

precisely determined. A great number of whimsical, extravagant and contradictory opinions relative to the senses may be mentioned.

I do not remember, that the *moral* sentiments have ever been derived from the external senses: it is consequently unnecessary to prove that such an assertion would be erroneous. This, however, is not the case with respect to the *intellectual* faculties. According to many ancient philosophers, all ideas are innate, and only excited by the external senses. Since the times of Bacon and Locke, however, the greater number of philosophical systems rest upon the axiom of Aristotle: that all ideas come into the mind by means of the external senses. According to this principle, the perfection of the manifestations of the intellectual faculties depends on the perfection of the external senses. Now if the ideas and sensations of man and animals are either produced or excited, solely or especially, by the five senses, man and animals ought to manifest themselves according to external objects and accidental impressions. Their faculties ought to be proportionate to the perfection of the five senses, and to the education bestowed on them; and

it ought to be possible to change and modify each individual at pleasure. Daily experience contradicts this hypothesis.

Philosophers of another class maintain that the mind acts independently of all organization, and that the senses are rather an impediment to, than instruments of, action. They complain much of the illusions of the five senses; and they despise all testimony and all conclusions grounded upon sensation. According to them that only is truth, which may be conceived by the understanding alone. If the influence of all external objects, of all social institution, of education in general be denied, this opinion is evidently in contradiction with the history of all times and of every individual. If all truth resulted from reflection alone, it would be easy to establish general laws, and it would be unnecessary painfully to collect a great number of facts and experiments in order to deduce from them general principles. But history proves the insufficiency of reflection alone, that is, unguided by experiment.

Finally, still other philosophers admit two sources of the manifestations of the intellectual faculties, an external and an internal; and they consider the manifestations of the

intellectual faculties as dependent on one or other of these sources. I shall here first state that many faculties attributed to the external senses cannot be considered as their effect, and I shall then examine the special functions of each external sense. Before, however, I consider each sense in particular, I shall enter into some general considerations relative to all the senses.

Generalities as to the Five External Senses.

The organs of every sense are double, as the organs of animal life in general. There are two eyes, two ears, and two nerves of smell, of taste and of feeling. Some authors have denied the doubleness of the cerebral organs; but the denial was founded on their mistaking their doubleness for their symmetry. It is true that both organs are seldom symmetrical; but is not this the case with both eyes, both ears, and with other double parts? Thus the want of symmetry does not annihilate their doubleness.

Another general consideration as to the five senses is, that, while each has two sentient apparatus, and while their impressions are accordingly double, yet the conscious-

ness of both impressions is single. Various explanations have been given of this phenomenon; and the sense of sight has generally been the point considered by those who endeavoured to explain it. I, however, think that we are not yet acquainted with its true cause.

A third general consideration as to the five senses is, that each performs its functions by its own peculiar power. Much has been said of the mutual rectification of the five senses and of their habits. It is, however, a general principle that the power of every sense is innate and inherent in the sense itself. The relations of every sense to external impressions are determinate, and subjected to positive laws. As soon as any odour makes an impression upon the olfactory nerve, this impression is found to be either conformable and agreeable to the smell or to be otherwise, and according to this relation between the external impressions and the senses, the manner of acting of man and animals is different. No preceding exercise or habit is necessary in order to acquire the special power of every sense: the functions of every sense depend only on its peculiar organization. If this be perfect, the func-

tions are perfect also, and if the organization be diseased, the functions are deranged notwithstanding all preceding exercise. If the optic apparatus be perfect in new hatched birds, their sight is perfect; for instance, in chickens, ducks, partridges and quails: on the contrary, if in new-born animals the organization of their eyes and ears be imperfect, their seeing and hearing powers manifest themselves with corresponding imperfection. If in adult persons the eyes be diseased, the vision is deranged. In old persons, the functions of the five senses lose their energy, because the vital power of the organs decreases.

It is indeed ridiculous to suppose that nature should have produced any sense, which could not perform its functions without being supported by another and a different sense; if, for example, we could not see without feeling, or if we could not hear without seeing. We must, however, enter into this consideration: that no sense acquires its faculty by any other sense; that every sense cannot produce the same sensations; that different senses may distinguish other beings; and that one sense is more fit than another to make us acquainted with different bodies

and their qualities. The laws of sight are determinate, and a straight rod plunged in water appears crooked, because we see according to the laws of the refraction of light. Touch however proves that the rod is straight. This is a kind of rectification; but this kind of rectification must not be confounded with the idea according to which one sense acquires its faculty by the rectification of another sense: touch may show that a rod which is plunged in water, and looks crooked, is straight; but the eyes will always see it crooked. This rectification of the senses is mutual, but not the prerogative of one sense. In this view, the eyes may rectify the sense of touch. If, without knowing it, a thin paper be placed between two of our fingers, for instance, between the thumb and fore-finger, we may not feel it, but we may see it. Even smell and taste may rectify the senses of seeing and of touching. Thus many fluids look like water, and it would be impossible to distinguish them by the sense of touch; but it is easy to do so by smell and taste. Thus every sense has its peculiar and independent faculty; and its manifestations are subject to constant laws, and depend on its respective organi-

zation; but every sense also perceives impressions of which another is not susceptible; and in this respect it is that the external senses rectify each other.

It is also a general observation that while no sense acquires its faculty by exercise, yet the functions of every sense are strengthened by exercise. The sense of feeling, if it be exercised, may acquire a very high degree of perfection. Thus blind persons feel the proximity of external objects by the impression of the air upon their faces.

The sense of taste is strengthened by exercise, as well as every other sense. At first, certain dishes appear tasteless or unpleasant—for instance, oysters, or truffles; but, after having eaten of them several times, we distinguish their particular savour. It is a common opinion that the sensibility of taste is early in life blunted by spicy dishes and by all those refinements of luxury which are daily invented: but is it possible to maintain that our cooks and epicures have a taste more obtuse than those savages, who distinguish the flavour of some roots which are insipid to us? Do not the frequent poisonings by vegetables, as by hemlock, belladonna, or poisonous mushrooms, prove that

the taste of the sober countryman is not a surer guide to salubrity than the taste of the voluptuous citizen? We must, however, admit in respect to the sense of taste what happens in respect to every other sense:—if impressions upon it be too strong its sensibility is blunted. The functions grow more energetic only by a conformable exercise.

The sense of smell is also susceptible of exercise. Several physicians, in the passage to a room, distinguish the kind and state of certain diseases. It is related that some negroes follow other persons by their track as dogs do, and discern the traces of a negro from those of a European. In the same way, the smell is blunted by the use of too strong and penetrating odours; but a conformable exercise strengthens its functions.

The sense of hearing is, like the other senses, improved by exercise. The blind Weissenbourg, of Manheim, judged exactly of the distance and size of persons who in an erect posture spoke to him. The blind Schoenberger, of Weide, in the Upper Palatinate, had the sense of hearing so acute, that it was sufficient to indicate, by striking, the place where the nine pins were put up, or the mark to be shot at, and he often hit

the aim. Blind persons often find the pin or piece of money which makes a noise in falling.

Finally, the eyes acquire by exercise a very high degree of activity. Deaf and dumb persons distinguish what other persons say from the motion of their lips.

A fifth general consideration, as to the external senses, is that their functions are modified not only in different kinds of animals, but even in different individuals of the same species. The taste and smell of carnivorous and herbivorous animals undoubtedly differ.

Moreover, the external senses are adapted only to perceive the impressions which are given; but they cannot produce their own enjoyments. Animals are confined to the use of those impressions which are presented to them; they prefer the taste of one thing to another; they prefer particular odours, colours and sounds to others; but they cannot, at will, command the more agreeable impressions. Man alone is capable of this.

Still another general consideration, as to the external senses, relates to the nature of their functions; these are immediate or mediate; that is, every external sense perceives one particular kind of impression, and ex-

ites, by means of its organization, only one kind of sensation. This peculiar sensation is then the *immediate* function of each peculiar sense. The external senses are also intermedia for the action of the internal faculties, and all those functions of the external senses which are necessary to the accomplishment of the functions of the internal faculties are *mediate*.

Particularities of the Five Senses.

FEELING.

The sense of feeling and muscular motion are ordinarily considered, as combining to constitute one sense; and this sense of touch, as it is called, produces, according to a great number of philosophers and physiologists, many instinctive labours of animals and the mechanical arts of man. I think, that the nerves of motion and those of the sense of feeling are quite different; there are anatomical, physiological and pathological proofs. The other hypothesis, that the external instruments produce the determinate faculties, may be easily refuted. Many animals have those instruments to

which peculiar faculties are attributed, yet these instruments do not in them produce the corresponding functions. Monkeys have hands, and they can put wood on a fire; but have they understanding enough to keep up the fire? According to this opinion insects, crawfish, lobsters, and especially cuttle fish, ought to have exact ideas of extension, size, and of geometry in general, in consequence of their numerous and perfect organs of touch.

The external instruments, moreover, are often similar, while the functions performed by them are quite different. The hare and rabbit have similar feet, yet the hare lies in the midst of the fields, while the rabbit makes burrows.

On the contrary, similar functions are observed in animals which have instruments quite different. The proboscis is to the elephant what the hand is to man and to the monkey. The hands of monkeys, and the feet of parrots and squirrels, are certainly different; yet by means of these instruments they hold up their food when they eat. In order to dig up truffles, the hog ploughs the earth with his snout, and the dog scratches it with his feet. According

to our manner of thinking, similar internal faculties produce similar effects by means of quite different instruments.

There are, moreover, in man and animals many faculties which cannot be considered as the effect of external instruments. Who, for example, can show, from any external organ, why crows live in society, and magpies in pairs? why the cuckoo and chamois are wild by nature, and the pigeon and goat are tameable? why bustards and cranes place sentinels? why ants gather provisions &c.?

Finally, even in mankind there is no proportion between the manifestations of the faculties and the perfection of the external instruments. If man owe his arts to his hands, why do not idiots invent?—why do painters drop the pencil, sculptors the chisel, and architects the compass, as soon as their understanding is deranged, while other individuals bring forth stupendous works by the assistance of crippled hands or of stumps. Who can measure capacities and talents for the art of building, according to the conformation of the hands? From these considerations, we consequently see that the external instruments do not produce the faculties.

I do not however deny the importance of these external instruments. It must even be admitted that there is some relation between the internal faculties and the external instruments. Without external instruments, the internal faculties cannot manifest themselves; without muscles, the will cannot actuate any limb; without hands, or something equivalent, we cannot seize any object. Carnivorous animals could not destroy without claws and teeth; without these instruments therefore they could not even subsist. Moreover, when the instruments are most perfect, the manifestations of the internal faculties are also most easy and perfect. Nevertheless it is unquestionable that the inclinations, propensities and intellectual faculties, which make use of the external instruments, must be derived from within.

Thus, the ancient doctrine of Anaxagoras, that the hand of man is the cause of his understanding, falls to the ground: and it is evident, that the wisdom of Solomon, Solon and Plato, and all the master-pieces of Homer, Euclid, Raphael and others, are by no means the result of their hands; and that the surprising instincts of animals are not the effects of their antennæ, or of their

feet, teeth, probosces, or tails. I repeat, that it must nevertheless be allowed that the external instruments, though not in proportion to the internal faculties, cannot be in contradiction to them, and that these faculties perform their functions with greater facility and in higher perfection, if the external instruments be more perfect. Therefore the hand of man, which is divided into several moveable parts, and capable every moment of changing its form, and of closely surrounding the surface of external bodies, is more fit for appreciating their tactile qualities, than the feet of birds invested with scales, or than those of quadrupeds covered with a horny substance. Yet it is not the less certain that the external instruments are never the cause of the internal faculties.

The sense of feeling is of all the most extensive, being continued not only over the whole external surface of the body, but even over the intestinal canal. It produces the most general perceptions of pain and pleasure, the sensations of temperature, and those of dryness and moisture. All its other functions are only mediate. Even the ideas of roughness and smoothness belong to an internal faculty; namely, that of form. In

respect to the mediate functions, the sense of feeling may be called touch, of which the sphere of activity is very considerable and important: it is principally combined with voluntary motion, and the two kinds of nerves on which these depend may then assist all internal functions, both moral sentiments and intellectual faculties. Hence it is evident why the connexion of the nerves of feeling and motion, with the organs of the moral sentiments and intellectual faculties, is the most intimate. For it is a circumstance both conceivable in itself, and proved by experience, that the five external senses are in connexion with the cerebral organs which they assist; and as the nerves of motion and feeling may assist all internal faculties, they also are connected with all the internal organs, in the same way as the nerves of feeling and motion are connected with each other.

TASTE.

After feeling, this sense seems to be the most general and the most indispensable in living beings which consciously take food. It seems also that this sense is active very early in life. The fifth pair of nerves, several

branches of which are distributed to the papillæ of the membrane covering the palate, the velum pendulum, the pharynx and chiefly the tongue, is greatly developed in new-born children, in the same way as are the nerves of motion and feeling. As the organ of taste is the first which is developed, so it seems to be the last which loses its activity. Old persons commonly esteem good food, which also is necessary for them. When their sight is extremely weak, when they are almost deaf, and when their skin is wrinkled, stiff and almost insensible, they drink and eat as heartily and with as much pleasure as their grand-children.

The sphere of activity of this sense is confined to the sensations of taste; that is, it perceives only impressions of savour. *Mediately*, it gives assistance to nutrition. The nerves of taste have the most intimate connexion with the nerves necessary to the motion of the jaws, with the nerve of the organ of voice, and with the glossopharyngeal nerve. Accordingly, the organs on which these nerves are expanded exert the greatest influence on one another.

SMELL.

By means of smell the external world begins to act upon man and animals from a distance. Thither odorous particles are detached from bodies, and inform man and animals of the existence of the bodies to which they belong. Several physiologists consider smell as a completion of taste, or as a finer and higher degree of taste. But the olfactory nerve constitutes a particular system: it is the explorer and the guide of the sense of taste.

A great number of physiologists attribute to the sense of smell the surprising faculty of many animals, by means of which they again discover their dwellings; but there are many phenomena which cannot be explained by smell alone. A dog, for example, at the end of several months, and at a distance of more than a hundred leagues, finds his former dwelling and master; though he has been carried away in a coach; though it has rained repeatedly during this interval of time; though the dog has gone by water and comes back by land; though he is obliged to make circuits instead of taking the nearest way,

and though the wind has changed in all directions. These and similar phenomena it is impossible to explain by the sense of smell.

The immediate functions of smell consist in perceiving the odorous particles of external bodies, and in thereby informing man and animals of the existence of their aliments, &c. All its other functions are mediate.

HEARING.

In new-born children this sense is not yet active, but it improves by degrees and in proportion as the vigour of the organ of hearing increases. It is a very common opinion, that music and the faculty of speech are the result of the sense of hearing. Yet neither one nor the other is produced by that sense.

Hearing cannot produce music, because there is no proportion between hearing and the faculty of music, either in animals or in man. Many animals hear very acutely, and are yet insensible to music. Among birds the female hears as well as the male : if hearing then produce music, why does not the former sing? Among mankind there are individuals whose hearing is very obtuse,

and whose talent for music is yet very considerable. Finally, hearing cannot produce music, because hearing perceives only tones which are already produced. The first musician therefore began to produce music from an internal impulse, and that music of course he had not previously heard. Singing birds, moreover, which have been hatched by strange females, sing naturally, and without any instruction, the song of their species as soon as their internal organization is active. Hence the males of every species preserve their natural song, though they have been brought up in the society of individuals of a different kind. Hence also musicians, who have lost their hearing, continue to compose. Hence likewise deaf and dumb persons have an innate sentiment of measure and cadence. Though, however, hearing does not produce music, yet it is necessary to perceive and to execute music.

It is also a very common opinion that hearing alone, or hearing and voice conjointly, produce the faculty of speech. The best way to refute this error is by inquiring, in what any language consists, and how every language is produced? Language in general is the medium by which sensations

and ideas are mutually communicated; and this may be effected by sounds, gestures, or by other signs. Language, then, may be divided into two classes: into natural and artificial, arbitrary or conventional.

With regard to the immediate function of the sense of hearing, it is confined to the perception of sounds; yet it assists a great number of internal faculties; as chiefly the moral sentiments, and the faculties of space, individuality, tune and speech, and thereby all the intellectual faculties and sentiments. The auditory nerve in particular has a more intimate connexion with the organs of the moral sentiments than with those of the intellectual faculties: it embraces the nervous bundle of the cerebellum, and is connected with the vocal nerves. Therefore the voice, as natural language, is more energetic in sentiments than in intellectual faculties.

SIGHT.

This is the fifth and last of the senses, or the second of those which inform man and animals of remote objects by means of an intermedium—light. None of the senses has

more occupied physiologists and philosophers, than those of sight and touch; but it is with regard to them also that the greatest number of errors has been committed. Many erroneous opinions have been, and are still, maintained in respect to vision. It has been said that this sense acquires its faculty either by touch or by habit; but no sense acquires its faculty, either from any other sense, or from habit. Vision depends on the organization of the eye; and is weak or energetic, imperfect or perfect. Some animals come into the world with perfect eyes, and these animals see perfectly from the first. The butterfly and honey-bee fly at the first attempt through fields and flowery meadows, and the young partridge and chicken, as soon as they have left the shell, run through stubbles and corn, while other animals, which are born blind, distinguish the size, shape and distance of bodies only by slow degrees. This latter is the case also with new-born children. I cannot enough inculcate that every sense has its own laws, and that its functions depend on the healthy and perfect state of its organization. In the looking glass we see ourselves and other objects enlarged, diminished,

lengthened, shortened, multiplied, near, distant &c., according to the laws of the refraction of light.

It is also maintained by some, that without the sense of touch, the eyes would represent to us all objects in a reversed situation and double, and that all objects would seem to be in the eyes, because the objects are painted on the retina. The contrary, however, of all these erroneous opinions is easily shown by comparative physiology.

It is also a common opinion that the art of painting is the result of sight, and it is certainly true that the eyes are as necessary to perceive colours as the ears are to perceive sounds; but the art of painting does not consist in the perception of colours, any more than music in the perception of sounds. Sight, therefore, and the faculty of painting are not at all in proportion to each other. The sight of many animals is more perfect than that of man, yet they do not know what painting is, and even among mankind the talent of painting cannot be measured by the acuteness of sight. Great painters never attribute their talent to their eyes; they say, it is not the eye, but the understanding which perceives the harmony of colour.

The sphere of activity of the immediate function of sight is confined to the perception of light. All its other functions are mediate. The eyes may accordingly assist all the other external senses, all the moral sentiments, all the intellectual faculties, and principally the latter of these.

From all I have said of the five external senses, it results that their spheres of immediate activity are very limited; that feeling perceives only dryness, moisture and temperature; that taste perceives savours; smell odours; the ears sound; and the eyes light: and hence that all the other functions are only mediate.

FUNCTIONS OF THE BRAIN, OR INTERNAL ORGANS OF THE MIND.

For many centuries it has been said, the brain is the organ of the soul; the meaning, however, of this expression was that the brain is the organ of the intellectual faculties, while, according to the ancient opinion, the feelings have been placed in the viscera of the abdomen and thorax. We consider the brain as the organ not only of the intellectual faculties, but also of the moral feelings.

In support of this truth, I accordingly make the following observations. All the parts of the body may be wounded or destroyed, even the nervous mass of the spine may be compressed or injured at a certain distance from the brain, without immediately destroying the feelings and intellectual faculties. In tetanus produced by a cause remote from the brain, the other nervous systems are attacked in the most violent manner, while the functions of the mind remain sometimes till death. On the contrary, if the brain be compressed or destroyed, its functions are deranged, and the manifestations of the feelings and intellectual faculties are suspended or annihilated. Moreover, automatic life requires neither the brain nor the cerebellum. The superior parts of both hemispheres, the great commissure, even more than half the cerebellum, may be wounded, destroyed by suppuration, diminished in size, or taken away, without destroying the functions of the five external senses and automatic life. Several acephali, or monsters destitute of the brain, are born strong and fat, some of them even live some time after birth. Consequently if the brain be not destined to superior functions, its existence would be useless. But it is proba-

ble that the most perfect of all the nervous systems has also an object corresponding to its organization.

However defective our knowledge of the scale of the brain from the lowest animals to man may be, it is nevertheless certain that the number of faculties increases in proportion as the cerebral parts multiply. This multiplication of the feelings and intellectual faculties of man, and of the instinctive labours of animals, is neither in proportion to the five external senses, nor to any other part of the body, but only to the cerebral parts. This could not happen if the brain were not exclusively the organ of the feelings and intellectual faculties.

Again if the developement of the brain be defective, the manifestations of the feelings and intellectual faculties are also defective. Accordingly, an infinite number of observations prove that the brains of idiots from birth are defective; and that the manifestations of the feelings and intellectual faculties improve and become perfect in the same proportion as the organization of the brain improves. On the contrary, if the developement of the brain be very considerable, the manifestations of the feelings and intellectual

faculties are very energetic. Let the observer then consider the heads of those who have excelled by great talents and capacities; bearing however in mind the difference between a large brain and a large face: the brain may be small and the face large, or the brain large and the face small. Indeed the manifestations of the faculties follow the ordinary or extraordinary growth of the organs: in children the brain is yet pulpy, and therefore the functions of animal life cannot be manifested; in proportion as the brain increases by degrees the faculties manifest themselves; in the state of maturity the brain has acquired the highest degree of developement, and the manifestations the greatest energy; and in proportion as the organization of the brain decreases, the energy of the moral sentiments and intellectual faculties decreases also.

If moreover the developement of the brain do not follow the common order: if it take place too early or too late, the manifestations of the moral sentiments and intellectual faculties are subjected to the same changes. Certain faculties also are more active in men, and others in women, according to the difference of their cerebral organization. The feelings and intellectual faculties are even hereditary

in the same proportion as the organization of the brain is propagated from parents to their children. Hence as there is a proportion between the developement, increase and decrease of the brain, and the manifestations of the moral sentiments and intellectual faculties, the conclusion is evident that the brain is the organ of these faculties.

To the preceding proofs I may add, that the moral sentiments and intellectual faculties are weakened or deranged either by age or diseases, in the same proportion as the brain is altered. Finally, every one feels that he thinks by means of his brain. Thus all concurs to prove that the brain must be considered as the organ of the mind.

As it is demonstrated that the brain is exclusively the organ of the manifestations of the mind, it is to be investigated whether the whole brain must be considered as one single organ, or whether it is composed of as many particular and independent organs as there are particular and independent manifestations of the mind.

As soon as philosophers began to think of the beings of nature it was necessary to make divisions. The Greek philosophers, with Thales, called soul (*anima*) the cause of every

phenomenon, and they accordingly spoke of a soul of plants, a soul of animals and a soul of man. One soul was considered as vegetative, another as sensitive. Secondly, all the inclinations were considered as the result of the *animus*. Finally, the intellectual or reasoning part was called *mens*. Pythagoras, St. Paul, Galen, Gilbert, Gassendi, Bacon, Van Helmont, Wepfer, Leibnitz, Frederick Hoffmann, Haller, Blumenbach, Soemmerring, Reil, Barthez &c. admit different causes of the different phenomena of animals and man. Accordingly, Plato and several ancient writers speak of an irrational and of a rational portion of the soul; and all those who admit only one soul in man, as Anaxagoras, Aristotle, Thomas Aquinas, Descartes, Stahl &c. are obliged to acknowledge at least several faculties of the single soul. St. Augustin determined with great exactness the faculties which are common to man and animals, and those which are proper to man. Malebranche and many other philosophers speak of principal and secondary faculties. The former are understanding and will: the subdivisions of understanding are perception, memory, judgment and imagination; and those of will are inclination, desire, affections and passions.

Some authors have even subdivided these special faculties: thus, Vieussens speaks of two kinds of imagination; and others admit several kinds of memory, as a local memory, a verbal memory, a memory of facts, and a memory of time. Thus various principles, at least various faculties of the same principle, have at all times been admitted.

As the principles, or the faculties, were divided and subdivided, so different seats were assigned to them. The rational soul was commonly placed in the head; the irrational in the viscera of the abdomen. In this respect the ventricles of the brain have at all times been considered as of principal importance. The Arabs placed common sense in the anterior cavity of the brain, imagination in the second, judgment in the third, and memory in the fourth. During several centuries, the brain was considered as the organ of perception, and the cerebellum as the organ of memory, the degree of memory being measured by the protuberance of the occiput. St. Gregorius Nyssenens, in order to explain why the functions of the mind are not troubled, although the different senses propagate different impressions, compares the brain to a town which has several en-

trances and a great number of streets, by means of all which it is possible to arrive at the same point. Nemesius, the first bishop of Emesa, under the reign of Theodosius, taught that the sensations have their seat in the anterior ventricles, memory in the middle, and understanding in the posterior ventricles.

Albertus Magnus, archbishop of Ratisbon, in the thirteenth century, delineated a head, and indicated upon it the seats of the different faculties of the mind. He placed common sense in the forehead, or in the first ventricle of the brain, cogitation and judgment in the second, and memory and moving power in the third. Peter de Montagnana, in 1491, published a delineation of a head, on which were indicated the seat of *sensus communis*, the *cellula imaginativa*, *cellula æstimativa seu cogitativa*, *cellula memorativa*, and *cellula rationalis*. Lodovico Dolci published a similar delineation. He placed common sense in the forehead; imagination behind it; understanding in the cerebellum; and memory still lower in the neck. According to Serveto, the anterior ventricles receive the images of external impressions; the third ventricle is the seat of thought; the aqueduct of Sylvius, the seat of the soul, and the fourth ventricle,

the seat of memory. Willis considered the corpora striata as the seat of sensation and attention; and the medullary mass as the seat of memory: he placed reflection in the corpus callosum; and derived the moving spirits from the cerebellum.

Charles Bonnet considered each fibre of the brain as a particular organ of the soul. Boerhaave said that imagination and judgment must have different seats, because the former is active in dreaming, and the latter in watching. Haller and Van Swieten supposed that the internal senses occupy different places of the brain; but they considered its organization as too complicated, too intricate, and too difficult of investigation to permit us to hope that we should be able to point out the seat of memory, of judgment, or of imagination. Mayer, Professor at Frankfort on the Oder, thought it probable that the soul exercises its different faculties at different places of the brain; and he was disposed to think that the cineritious substance is the organ of memory, and the cerebellum that of abstract ideas. Prochaska thinks it more than probable that every internal sense is attached to a particular organ. Plattner speaks of two organs of the soul; a superior, and an in-

ferior. Mallacarne cannot imagine that the medullary substance of the brain is every where fit to receive the same impressions: he denies the central point of the nerves; considers the cerebellum as the seat of the intellectual faculties; and measures these according to the number of lamellæ of which the cerebellum is composed. Tiedemann, Wrisberg, Soemmerring and an immense number of physiologists and philosophers, admit the plurality of the organs; and they maintain that the different parts of the brain are destined to different functions. Soemmerring speaks, like Haller, of different provinces of the brain.

Thus from all these quotations, which might be extremely multiplied, it follows that the idea of the plurality of the seats or organs is very ancient, and that those who maintain that it is an invention of Gall are mistaken. It is now, therefore, only to be determined what are the faculties, and which are their respective organs? On these two questions I shall afterwards found a more detailed inquiry. Let us first examine in a general way the proofs which induce us to think that the brain must be considered as composed of different organs.

It is a general observation that nature, in order to produce various effects, has varied

their material conditions. This is observed throughout all nature: every salt and every métal has its own crystallization; every plant and every fruit-tree has its particular organization; even the parts of the same tree, as wood, bark, leaves, flowers and fruit, possess somewhat varying qualities. It is the same with animals: the organization of every variety of animal is modified, and, in the same animal, there is a particular organ for every function; the liver is destined to the secretion of bile, the heart and blood-vessels, to circulation, and the lungs, to respiration. The five external senses are separated, and are independent of each other. Thus nature is not so attached to simplicity and unity, as certain speculative philosophers are pleased to maintain. This plurality and independence of the organs of automatic life, and of the five senses, renders it probable that the different internal sensations and functions of the mind are also manifested by different and independent organs. Besides analogy, however, there are on this subject still other proofs furnished by the psychology of animals and man in the state of health and disease.

It is necessary that the brains of different animals should be different, because the facul-

ties of these animals vary. The beaver which builds its hut, the dog which hunts, the black-bird which sings, the swallow which migrates, cannot have similar brains. Thus to have a brain of this kind or of that is not an indifferent matter: the organization of the brains of these animals must be as different as that of their muscles. Even individuals of the same variety do not possess all faculties in the same degree: certain individuals excel, others are middling in all; some individuals are endowed with genius, others are idiots: hence the organization of their brains cannot be equally perfect. Moreover, if the brains of different animals were not composed of different organs, why should their understanding increase in proportion as their brains become complicated? It is also necessary that the cerebral organization of the sexes should at least be modified; for certain faculties are more active in women and females, and others in men and males. These modified manifestations are easily understood if we admit that certain organs are more developed in men and males, and others more in women and females.

In the same individual, moreover, certain propensities, sentiments and intellectual facul-

ties, manifest themselves with great energy; while others are scarcely perceptible: one excels in verbal memory, while he cannot combine two philosophical ideas; another is a great painter, and a bad musician, or a miserable poet; and a third is a great poet, and a bad general: a man may be pious and stupid, or pious and intelligent; and every one has his peculiar gifts. Hence the same mass of the brain cannot preside over the same functions. If there were only one external sense for all impressions, all the functions ought to take place as soon as one sense is active; but as the functions of the external senses are attached to different organs, one of them may be weak and another strong. It is the same with the internal senses: if the same organ manifested every faculty, how could the mind, by means of the same instrument, manifest one faculty in perfection, and another in a very limited manner?

The propensities and intellectual faculties do not manifest themselves simultaneously: several appear earlier; others disappear more lately. Certain faculties are very energetic in children, and others appear only in adult persons: some faculties disappear at the age of fifty or sixty, and others last till ninety or

a hundred. Now if the manifestations of all faculties were dependent on the same organ, they ought to appear and disappear simultaneously. All these difficulties however are removed, if we admit different organs which are developed and diminished, at different periods, in the same way as are the external senses. Smell and taste thus appear earlier than seeing and hearing, because their relative organs are earlier developed. The faculties of animal life, moreover, cannot continue incessantly to act, but need rest; and it is known that study too long protracted produces fatigue, while we may continue to study by changing the object. Now if the brain were a single organ performing all the functions of the mind, why should it not be more fatigued by this new species of action? Our eyes may be fatigued by looking at pictures, but we can still listen to music, because there is one organ for hearing and another for seeing. This consideration is very important in medicine; for, by attention to these circumstances, it is often possible to prevent partial insanities. Thus, if a person have one organ so very active, whether on account of its great developement, or its great irritability, that this activity is almost involuntary, or

that the person has not the power of putting it in action, and of recalling it to rest, then it is necessary to avoid every thing that has any relation to this faculty, and to put in action quite different ones. This alternate state, however, of action and rest would be impossible, if there were only one single organ.

As in the state of watching the same organ cannot be always active, but must at intervals rest: so in the state of sleeping all organs do not remain inactive, but a particular one occasionally enters into action, and this constitutes the state of dreaming. Watching is indeed called the state wherein the will can put in action the organs of the intellectual faculties, of the five senses, and of voluntary motion; but it is most incorrect to define watching as the state wherein all these organs are active; for it cannot happen that all faculties should at the same time be active. All organs being fatigued take rest, and this state of rest is sleep; but any particular organ, or even several organs, may be active while the others rest. The peculiar sensations, then, or ideas, which result from this particular activity, constitute *dreams*, which are more or less complicated according to

the number of the active organs. It may here be asked, whether the soul or mind can ever be without any idea? Formerly it was a general opinion that activity is the essence of the soul; and, in order to maintain this opinion, it was said, that in the deepest and most complete sleep, the soul continues nevertheless to act and to think, but that no one had consciousness of it. It may be asked how are we assured of this action? And it may be reckoned entirely suppositious. At all events it is evident that the state of dreaming proves the plurality of the organs of animal life; and it would be impossible to have particular dreams, or combinations of ideas and sensations, if the brain were one single organ, and if every faculty were not attached to a particular and independent organ.

The state of somnambulism equally proves the plurality of the organs. This is a state of incomplete sleep, wherein several organs are watching. Now it is known that the brain acts upon the external world by means of voluntary motion, of the voice, and of the five external senses. If then in sleeping particular organs be active, dreams take place; if the action of the brain be propagated

to the muscles, there follow motions; and if the action of the brain be propagated to the vocal organs, the sleeping person speaks. Indeed it is known that some sleeping persons dream and speak; others dream, speak, hear, and answer; and others again dream, rise, do various things and walk. This latter state, then, is called somnambulism, that is, the state of walking during sleep. Now as the ear can hear, so may the eyes see, while the other organs sleep: and there are facts quite positive which prove that several persons in the state of somnambulism have seen, and certainly always with open eyes. There are also convulsive fits in which the patients see without hearing, and *vice versâ*.

Some somnambulists even do things of which they are not capable in a state of watching; and some dreaming persons reason sometimes better than they do when awake. This phenomenon is not astonishing. If we wish to reflect upon any object, we avoid the noise of the world and all external impressions; we cover the eyes with our hands, and we put to rest a great number of organs in order to concentrate all vital power in one or in several. In the state of dreaming and in somnambulism, this natu-

rally happens; consequently, the manifestations of the active organs are then often more perfect and more energetic; the sensations are more lively, and the reflections deeper, than in the state of watching. Without knowing their danger, such persons do things which are possible to be done, but which they would not do, being acquainted with the danger they run. Therefore, somnambulists ought not to be awakened when they are exposed to danger.

Inspirations, visions, and similar phenomena, find their explanation only in the plurality of the organs; and consequently these phenomena contribute to demonstrate it. In order to understand visions, it is necessary to recollect the state of dreaming. In dreaming, the whole external world is represented inwardly to the mind. We see objects, our friends, or enemies; we speak with them, we walk, we eat, drink, sing, hear music &c., and all these things happen in the brain of him who dreams. Visions are only internal sensations or ideas, which are so strong and so energetic, that, though in the state of watching, the person refers them outwards and considers them as real; for instance, he sees inwardly some person, and he

admits his outward existence. Visions are transitory or permanent. In the latter case, it is a true alienation of the mind. This explains why visionaries fancy that they see beings, or that they are accompanied by demons; and why sorcerers have imagined they conversed with the devil. It is even known that sorcerers produced such illusions by external applications or frictions, with narcotic ointments composed of dulcamara, bella donna, stramonium, hyosciamus, opium &c.

The state of disease proves also the plurality of the cerebral organs. For how is it possible to combine partial insanities with the unity of the brain? One faculty may be deranged, while the manifestations of all the other faculties of the mind may be regular. To this belong all fixed ideas or monomaniaë. On the other hand, there are madmen who are reasonable only in one kind of manifestations of the mind. A chemist was a madman in every thing except chemistry. An embroiderer in her fits, and in the midst of the greatest absurdities, calculated perfectly how much stuff was necessary to such or such piece of work. It follows from all these considerations, that there are as many

organs as there are special and independent faculties : consequently the brain cannot be considered as one single organ, but as composed of several. Before I determine the special faculties and their respective organs, I shall answer the most important objections against this principle.

Before I consider the particular organs, I shall answer a question which may be put with respect to every organ, viz., *Why do you admit a particular organ of this, and not of another function ?* In speaking of actions alone, it is certainly difficult to conceive the necessity of particular organs ; yet the answer is decisive if we can say, Experience demonstrates it. As moreover I look for special faculties and not merely for organs and signs, the necessity of every organ may be demonstrated even by reasoning, that is, by the proofs which demonstrate the plurality of the organs. Consider these proofs in respect to every organ, and it is impossible to be mistaken. Hence it is necessary to point out a particular organ for every faculty,

1. Which exists in one kind of animals and not in another :

2. Which varies in both sexes of the same species :

3. Which is not proportionate to the other faculties of the same individual :

4. Which does not manifest itself simultaneously with the other faculties, that is, which appears or disappears earlier or later than the other faculties :

5. Which may act or rest alone :

6. Which alone is propagated in a distinct manner from parents to children : and

7. Which alone may preserve its proper state of health or disease.

Gall did not determine any organ in conformity with these views. He followed only the empirical method, that is, he looked for organs according to the active functions of man. I have mentioned, however, that the actions do not always indicate the special faculty ; and that there are very few actions which result from one of these faculties. Nevertheless, the proceeding of Gall is conducive to the determination of the special faculties, and of their sphere of activity. I shall not then treat of the organs in the order in which they have been discovered, but according to their situation in the brain, beginning with that which is lowest in situation.

I divide and subdivide the class of mental

faculties, according to the common practice of natural history, into orders, genera, species and varieties. The expression *Mind* designates the class of faculties. I divide it into two orders: feelings (*Gemueth*, in German) and intellect. The feelings are subdivided into two genera; propensities and sentiments. The propensities begin with those of eating and drinking; and many instincts of animals belong to this genus, while others, as those of singing and migrating, belong to the knowing faculties. The second genus of feelings consists in sentiments, some of which are common to man and animals, and others proper to man. The second order consisting of mental faculties, the intellect is subdivided also into two genera: knowing, and reflecting faculties. Moreover, there are different species of propensities, of sentiments, of knowing, and of reflecting faculties. There are varieties of the different species, and we observe even monstrosities in the manifestations of the peculiar faculties.

ORDER I.—FEELINGS.

GENUS I.—*Propensities*.

I. ORGAN OF AMATIVENESS.

Dr. Gall did not originally think that there was an organ of this propensity in the brain; but discovered its existence by chance. Being physician to a widow who was subject to very strong hysterical fits, during which she drew her head backward with great violence, Gall sometimes supported her head with his hand, and in doing so, observed that her neck was very large and hot. He was acquainted with her character as well as with this fact, and he accordingly considered in connexion her passion, this magnitude of the neck, and the consequent developement of the cerebellum: he was naturally led to inquire, whether there might not be some relation between the magnitude of the cerebellum and this particular propensity. Indeed, it is impossible to unite a greater number of proofs to demonstrate any natural

truth, than may be presented to determine the function of this organ.

In new-born children, the cerebellum is to the brain as one to nine, ten, thirteen, twenty or more; and in adults as one to five, six, or seven. Professor Ackermann maintains that the cerebellum is perfectly developed at the end of two years; but we have compared the heads and skulls of children from two till sixteen years of age, and we have always seen that at these ages the cerebellum is yet imperfectly developed. In proportion as the cerebellum is developed this propensity appears. It has, however, been said that the cerebellum is developed in proportion as this propensity is active; but other proofs show evidently that the developement of the cerebellum always precedes the manifestation of this faculty. In adult persons, the cerebellum being perfectly developed, this propensity exists in its greatest energy; and its activity is even proportionate to the particular developement of the cerebellum. It is known that men vary in respect to this propensity: in some individuals, it is almost wanting; in others it is moderate; in others again it is very violent. In the first the cere-

bellum is very small; in the second it is of a middling size; and in the third class it is very prominent.—It is indubitable, that men and male animals in general have a larger cerebellum than women and females. It is not, however, a law, that the cerebella of males are uniformly larger than those of females: there are exceptions, and of these more among mankind than among animals; but the cerebella are always proportionate to the degrees of the propensity.

It has been objected, that the brain, in general, is larger in men than in women, and that consequently, it is not astonishing that the cerebella of men are also larger than those of women. Many individuals, however, have large brains and small cerebella, and *vice versa*. There is consequently no proportion between the brain and the cerebellum; and this propensity is never in proportion to the size of the brain, but, *cæteris paribus*, always to that of the cerebellum.

It remains to be determined what name should be given to this propensity. It seems to me that every organ must be named according to its special faculty. As we do not say, nerves of nutrition, but nerves of hun-

ger and thirst, so here the name should express only the propensity: I therefore propose the name AMATIVENESS.

In order accurately to observe and to substantiate the organs in general, it is necessary to know their places. This particular organ is situated in the neck: discover the mastoid process behind the ear, and the protuberance of the occipital spine above the middle of the neck—the space between these two elevations indicates the extent of this organ in man. The observer will accordingly consider its size in all dimensions, and will compare its developement and the propensity with the actions of love which may characterize the individual. Those who in various animals wish to distinguish the external developement of the cerebellum by the shape and size of the neck, should be acquainted with the different structure of the cerebellum in mammiferous animals and birds. The cerebella of birds are single, and resemble the vermiform process of the cerebella of quadrupeds, which present lateral parts in addition to the vermiform process.

II. ORGAN OF PHILOPROGENITIVENESS, (*love of progeny*).

I shall endeavour, according to the method mentioned above, to prove by reasoning, that it is necessary to admit a particular organ of philoprogenitiveness; and I shall afterwards state the circumstances which led to its discovery. In some kinds of animals neither males nor females take care of their progeny; but the eggs are resigned to chance, and to the influence of some external agent: this is the case with insects, reptiles and fishes. Even among birds, the cuckoo gives a striking example of this. This bird has a great propensity to physical love; but it neither builds a nest, nor hatches its eggs; it deposits its eggs in the nests of other little birds which live on insects, placing only one egg in any individual nest: and the other birds hatch and nourish the young cuckoo with particular attachment. In some other kinds of animals, the females alone take care of their progeny. Thus bulls, stallions, dogs, cocks &c. are indifferent about their young; while the cow, mare, bitch, hen &c. are extremely attached to them. An extraordi-

nary instance of maternal attachment in a hound, belonging to Mr. Karswell, of Pensipple, in the neighbourhood of Plymouth, has lately occurred, and been inserted in the newspapers. Several puppies, which she had given birth to, were ordered to be destroyed in a pond. The person, however, employed, ineffectually performed his task with respect to one, which the mother, after he had retired, rescued in a half drowned state from the water, and conveyed to an adjoining marsh, where she temporarily deposited it in some bulrushes, until, by fetching straw and other soft articles, she had formed a proper bed, and continued to nurse it, for nearly five weeks, at every opportunity. Even her natural fondness for hunting gave way to parental affection, and she frequently left the pack, when engaged in the ardour of pursuit, to the surprise of her owner, who at length, by watching her motions, discovered the interesting secret. The surviving puppy has been permitted to live, and received the appropriate name of Moses. In other animals again, the males and females form an attachment for life, and both sexes take care of their progeny; this instinct being however more energetic in the

females. The fox, which so much resembles the dog, differs from him in this respect: the fox is attached to his female for life, partakes of the same cares with her, and if the female be killed he seeks food for his young ones; yet philoprogenitiveness is stronger in the female than in the male; for, if both be pursued, the male leaves the young ones sooner than the female. Many birds also are paired, and both males and females take care of the young. These differences are constant: does not each of them, even on the slightest consideration, seem to require peculiar organization?

In the human race, this propensity is, in general, stronger in women than in men. This difference is perceptible not only between fathers and mothers, but also between the sexes in general. A male servant seldom takes such care of children as a female. This difference, moreover, is sensible not only in grown-up people, but even in children; and accordingly if we present to children various playthings, boys will immediately choose horses, whips, drums &c.; and girls, on the contrary, will prefer dolls, cradles, ribbons &c.

In every species of animals, which take

care of their progeny, there are some females which do not feel this propensity, while certain males of these kinds excel in this inclination. Even among women certain individuals consider children as a heavy burden, while others deem them their greatest treasure and best source of happiness. This is not the case only among wretched persons, but indiscriminately among rich and poor, and among persons of good and of bad breeding. In general all the proofs which I have adduced of the plurality of the organs may be applied to the organ of philoprogenitiveness in particular. Its existence therefore is necessary.

The cerebral part which is situated immediately above that of amativeness, and corresponds with the general protuberance of the occiput, is the organ of philoprogenitiveness. Its developement, then, always coincides with the energy of this propensity. Species, sexes and individuals, which are endowed with a great deal of parental love, have this organ greatly developed; and in women and females, it is, in general, larger than in men and males. Gall possesses the skull of a woman who, being sick, had the confirmed notion of being pregnant with

five children; and in this skull, the corresponding organ is extremely developed. There are nations which excel in this propensity, and the developement of the respective organ is proportionate. Thus, negroes manifest this propensity in an eminent degree, and this organ is in them greatly developed. These are facts which every one may verify.

If among mankind the organ of philoprogenitiveness be very small, this phenomenon must be considered as a circumstance indirectly conducive to infanticide. We have examined the shape of the head in twenty-nine women who were infanticides; and twenty-five of them had the organ of philoprogenitiveness very small. The want of this organ does not indeed excite a mother to destroy her child, but a mother destitute of this propensity is less able to resist those external circumstances which provoke her to commit this crime. Such a mother will not resist as strongly as she would have done if her mind had been influenced by the powerful energy of philoprogenitiveness.

The aim of this faculty is obviously the care of the progeny. Its activity may be

too energetic, and do harm to children by spoiling them ; and if it be very small there must follow indifference about them.

By means of this and the preceding organ, it is very easy to distinguish the skulls of males and females of the same kind, and consequently also those of men and women. It is peculiarly worthy of notice that throughout all animals a striking similarity is preserved in the skulls of both sexes ; but the skulls of men and males are generally shorter and wider, while those of women and females are longer and narrower.

III. ORGAN OF INHABITIVENESS.

Dr. Gall observed in animals which have a great propensity to elevated stations, as in the chamois and wild goat, a protuberance which he identifies with the organ that in mankind produces pride and haughtiness. I think, however, that the instinct to assume physical height, and the sentiment of self-esteem, cannot be ascribed to the same organ. It is certain and must be conceded,

that animals which dwell upon mountains, or which are fond of high regions, have one part of their brain more developed than the varieties of the same kinds which live in low countries or in plains ; and this difference is quite sensible in roes, hares, rats &c. One species of rat, for instance, lives in canals, cellars, and the lower parts of houses ; another dwells in corn-lofts, and in the higher parts of the houses.

There are in England natural philosophers who doubt of the existence of such different species of rats ; but they exist positively in London as well as in Germany and in France, and I have experienced that a rat-catcher was perfectly acquainted with the natural history of these animals. He has procured me several individuals of each species, and their skulls evidently show the mentioned difference.

It is denied that animals which like elevated situations, are led there by an internal instinct attached to some particular organ ; and it is said that these animals frequent these places in order to look for their food. But some of these animals like situations where there is no food : and thus, the chamois and wild goat dwell upon the

tops of rocks which are entirely barren, and are obliged to descend into the middle regions in order to find their food. There are still other animals which like the higher regions of the air, and which yet seek their food upon the earth. Thus eagles and hawks hover high in the air, and catch mice upon the ground. Does the lark need to ascend into the air in order to sing? It is in general very unphilosophical to attribute the origin of any faculty of man or animals to external wants, though it must be allowed that external wants excite internal innate faculties.

In examining the habits and manners of living of various animals, it is obvious, that different kinds of animals are attached to different regions and countries. Nature, which intended that all regions and countries should be inhabited, assigned to all animals their dwelling, and gave to every kind of animal its respective propensity to some particular region. If we place any animal in another region, it leaves it and returns to its natural dwelling. Some animals seek the water from the first moment of their existence; and thus turtles and ducks, as soon as they are hatched, run towards it;

while other young animals stay upon dry land. Some of these like high regions, some the low countries and plains, and others the marshes. Among the inhabitants of the air, some species live in the higher and others in the lower regions; nor does the power of flying alone produce the instinct of hovering in the high regions of the air, for many kinds of animals, although their power of flying is great, are destitute of this instinct. Some birds also build their nests on the top of trees, some in the middle parts, and others in holes of trees, on the earth, on the banks of rivers &c.

In conformity with all these considerations, it seems to me that there is a particular faculty, and a special organ, which determines the dwelling of animals. The place of this organ is merely conjectural, and must be verified in the same way as that of every other organ. This propensity is common to the greater number of animals: hence its organ must be deep-seated in the brain, and must be looked for in the region of the other propensities; while self-esteem is a sentiment, and its organ occupies a higher place in the head.

IV. ORGAN OF ADHESIVENESS.

Friendship has long been considered as the result of reflection, as the consequence of some analogy between the faculties, or as an effect of mutual interest. Yet it is necessary to admit some particular instinct, which produces various manifestations of attachment in animals in whom no moral argument, nor any interest, can take place. This seems to be evident from certain examples among dogs: all of them not being susceptible of the same degree of attachment, though their external treatment ought to excite it: some dogs, on the contrary, are attached in opposition to their interest; and though sometimes they are ill-treated, yet remain attached to their master. An instance of great attachment of a bitch is mentioned by Mr. Vaillant. He had lost her during his travels in Africa; when, after repeatedly firing his gun and every fruitless search for her, he dispatched one of his attendants to return by the way they had proceeded, when she was found about two leagues' distance seated by the side of a chair and basket which had dropped un-

perceived from the waggon. Moreover, there is something involuntary in this sentiment; and its manifestations are too early and too sudden to result from any reflection. Even criminals have sometimes a great degree of attachment to their accomplices; and some among them have been known to destroy themselves rather than denounce their companions: thus a highway-man confined in the prison of Lichtenstein, near Vienna, hanged himself that he might not be forced to betray his accomplices.

These considerations prove the necessity of some organ of attachment. It is difficult however to point out its seat in man; for the actions in men are not sufficiently free, but are sometimes only embellished by the appearance of this sentiment. Gall seldom speaks of this organ. He examined, however, the head of a woman at Vienna, who was known as a model of friendship. She suffered different changes of fortune; she became alternately rich and poor; but was always attached to her former friends. Gall found the part of her head situated upward and outward from the organ of philoprogenitiveness, very prominent, and called it the organ of friendship. Our observations

are not multiplied enough to enable us to decide positively on this organ; yet its seat seems to me more than probable.

In considering the actions of man and animals, it may be observed that there is a great difference between different species, and even between different individuals of the same kind, in respect to attachment. If animals have amateness, like their progeny, and have a determinate dwelling, we then see that in several kinds of animals, males and females are attached one to another, and live domestically. This, for example, is the case with the fox and with many birds. The fox lives with its female, while the dog lives in polygamy, like the cock, bull and stallion. There is still another modification of attachment, that is, society, in which individuals of one kind are attached one to another and live together, while other animals live isolated. Here it is to be observed that the instinct of being attached for life, and that of living in society, are not mere degrees of energy, so that a lower degree produces attachment for life, and a higher degree of society. For there are animals which live in society without being attached for life, as the bull, dog, cock &c.; others live in so-

ciety and in family, as starlings, ravens, crows &c.; others again are attached for life without living in society, as the fox, magpie &c. Consequently, the instinct of living in society, and that of living in family, are modifications of their proper nature, in the same way as smell and taste are modified in carnivorous and herbivorous animals. Man belongs to the animals which are social and attached for life.

It seems to me that this special faculty extends its sphere of activity still farther, and that it gives us attachment to all around us, to inanimate beings, plants, animals and man, in short to all that we possess, whether animate or inanimate. Friendship consequently is only a part of this faculty. According to all preceding considerations, it seems to me that the name adhesiveness or attachment denotes this special faculty, which presents several modifications, and its objects are friendship, marriage, society, and attachment in general. Abuse results from its too great energy in nostalgia, or in regretting too much the loss of a friend &c. Without attachment men become anchorites and hermits.

V. ORGAN OF COMBATIVENESS.

Dr. Gall called together boys from the streets, and made them fight each other: there were some who liked it much, and others who, on the contrary, were peaceable and timid. In the former, that part of the head which corresponds to the posterior inferior angle of the parietal bone, behind the mastoid process, was prominent, and in the latter the same place was flat or depressed. The prominence was also found in the heads of brave and valiant officers, of quarrelsome students, of duellists, and of those whose greatest pleasure consisted in fighting and making themselves feared.

This propensity is active in different degrees, not only in mankind but also in different species of animals. There are animals which never fight; others are fond of it. Even individuals of the same kind differ entirely with respect to this faculty. One dog incessantly looks for an opportunity of fighting, another always flies away. The bull-dog gives ample proofs of his courage. It is known that when once exasperated no pain or punishment will induce him to

swerve from his purpose. Amidst the various instances which might be adduced, one well authenticated fact will be sufficient to corroborate the assertions, and which is quoted in the Sportsman's Cabinet, Vol. i. p. 89. "A juvenile amateur, confident in the pure blood and instinctive courage of his dog, proposed a trifling wager that he would at four distinct intervals, deprive the animal of one of his feet by amputation, and that after every individual deprivation, he should attack the bull with his previous ferocity, and that lastly, he should continue so to do upon his stumps. Shocking as the recital must prove to the feelings of every reader, the experiment was made, and the result sufficiently demonstrated the truth of the prediction." The courageous animals have the head between and behind the ears very large. This is also an unfailing sign to distinguish or recognize, if a horse be shy and timid, or bold and sure. The same difference is observed in game cocks and game hens, in comparison with the domestic cock. Horse-jockeys, and those who are fond of fighting cocks, long ago made the same observation.

The desire of fighting is necessary to ani-

mals as soon as they are attached to females, to progeny, to dwellings, or to friends; for, according to the arrangement of nature, it is necessary to fight in order to defend. Consequently, this propensity must exist for the purpose of defence; but it seems to me that this faculty is, like all others, general and not limited to self-defence. Therefore I call it the organ of the propensity to fight, or of combativeness. Sometimes this propensity acts with greater energy than it ought; it is charmed with combats: then it produces dispute, quarrelsomeness, attack, *viz.* abuses.

VI. ORGAN OF THE PROPENSITY TO DESTROY,
OR OF DESTRUCTIVENESS.

A difference in the skulls of carnivorous and herbivorous animals gave the first idea of the existence of this organ. If we place a skull of any carnivorous animal horizontally, and trace a vertical line through the external meatus auditorius, a great portion of the cerebral mass is situated behind that line; and the more an animal is carnivorous,

the more considerable is the portion of the cerebral mass situated there.

It is objected that it is useless to admit in the brain a particular organ of destruction, in order to determine the kind of food man and animals live upon; because nature has given to carnivorous animals the feeling of hunger, the taste, teeth and instruments necessary for seizing and masticating their prey. These external instruments, however, prove only the harmony between internal faculties and external instruments in general. Man has hands in order to take his aliments, but some interior sensation advertises man and animals of the necessity of taking food. The tiger, lion, cat &c. have teeth and claws, but an internal power excites them to use them. A sheep could not employ such instruments any more than an idiot could employ his hands to perform things for which they might be fit, but which his reason could not direct. Thus an internal propensity must make use of the external instruments, and this propensity is attached to a particular organ.

The propensity to kill exists beyond doubt in certain animals; and it is more or less energetic in animals of different species, and

even in the individuals of the same kind. There are some species which do not kill more than they need for their nourishment, while others, as the wolf, tiger, pole-cat &c. kill all living beings around them, and that seemingly for the pleasure of killing alone.

If carnivorous animals have the propensity to kill, man, being omnivorous, ought to have it also. There is indeed no carnivorous animal which eats so many kinds of animals as man does: animals are confined to a certain number of species for the choice of their food, but man lives upon all, and anthropophagi even upon their fellow creatures: he kills from the insect to the elephant and the whale, in order to apply them to his purposes. It is said that man eats flesh only from depravity of habit; but in examining the teeth of man, it is evident that they partake of the structure both of those of carnivorous and of herbivorous animals. It is the same with the stomach of man: it differs much from the stomach of herbivorous animals, and in several circumstances, resembles that of the carnivorous.

In man this propensity presents different degrees of activity, from a mere indifference to the pain of animals to the pleasure of

seeing them killed, or even to the most irresistible desire to kill. This doctrine may shock sensibility, but it is not the less true. Whoever endeavours to study nature and judge of its phenomena must admit the existence of things as they are. It may be observed that in children as well as in adults, among the uncultivated as well as among the polite and well bred classes of society, certain individuals are sensible, and others indifferent, to the suffering of others. Some persons feel a pleasure in tormenting animals and in seeing them tortured or killed, even when it is impossible to ascribe this disposition to bad habit or bad education. There are even individuals who choose their profession according to this propensity, if it be very energetic. A student often shocked his school-fellows by his extraordinary pleasure in tormenting insects, birds and other animals: and in order, as he pretended, to satisfy this inclination he became surgeon. A journeyman apothecary, at Vienna, felt so great a propensity to kill, that he became an executioner:—the son of a rich merchant, of the same city, gave up commerce and became a butcher:—and a rich Dutchman paid the butchers who furnished the

navy with beef, for permission to kill the oxen.

We may also determine the existence of this propensity, and its diversities, by the impressions which different spectators receive from public executions. The view of them is insupportable to some individuals, and delightful to others. Accordingly George Selwin sought for such spectacles, and always endeavoured to stand near the executioner: and it is reported of La Condamine that, being fond of such spectacles, on his at one time endeavouring to pass through the crowd, as the soldiers pushed him backward, the executioner said to them, Let that gentleman pass, he is an amateur. Mr. Bruggmans, Professor at Leyden, told us of a Dutch priest who had so violent a desire to kill and to see animals killed, that he became chaplain of a regiment solely in order to have an opportunity of seeing men destroyed; and the same clergyman kept in his house a great number of different domestic animals, as cats &c., in order to satisfy his natural propensity by killing their young: he also killed all the animals for the use of his kitchen. He was moreover acquainted with the hangmen of the country,

received notice of each execution, and travelled on foot for several days in order to witness it, when the executioners always placed him near them. In the field of battle we find a great difference in the energy of this propensity: one soldier is overjoyed at the sight of the blood which he sheds, while another, moved by compassion, gives uncertain blows, or at least spares the vanquished, and stops of his own accord after the victory.

There are highway-men who are not content with robbing, but who manifest the most sanguinary inclination to torment and kill without necessity. John Rosbeck was not content with maltreating his victims in order to make them betray the place of their concealed treasures, but invented and employed the most outrageous cruelties merely to witness the sufferings of children, of women and of old persons. Moreover neither fear nor torture could correct him. On his being first caught he was for eighteen months shut up in a small subterraneous dungeon, his feet were loaded with chains, he stood in muddy water up to his ankles, and when dragged out of this place he was cruelly tortured; nevertheless he did not

confess any thing. He was afterwards enlarged; the first thing he did, when free, was to steal in full daylight; and having soon committed new murders, he was executed.* At the beginning of the last century several murders were committed in Holland, on the frontiers of the provinces of Cleves. For a long time the murderer remained unknown; but at last an old fiddler, who was accustomed to play on the violin at country weddings, was suspected in consequence of some expressions of his children. Led before the justice, he confessed thirty-four murders, and he asserted that he had committed them without any cause of enmity, and without any intention of robbing; but only because he was extremely delighted with bloodshed. At Strasbourg two keepers of the cathedral were assassinated; for a long time the murderer remained undiscovered; but at last a postillion was killed by a pistol shot by a clergyman, called Frick. This monster, in order to satisfy his horrible propensity to murder, had hired a post-chaise for the express purpose of killing the postillion. He was arrested; confessed

* History of Schinderhannes, t. ii. p. 8.

that he was the murderer of both keepers of the cathedral; and without changing countenance acknowledged that when yet a student he had often enticed children to follow him into the woods, that there he had hanged them on trees, had kindled a fire under them, and so destroyed them. Now this criminal was rich, and had never stolen: for his crimes, however, he was burnt alive at Strasbourg. "Louis XV." says M. de Lacretelle,* "felt a rooted aversion against a brother of the Duke of Bourbon-Condé, Count of Charolois, who would have renewed all the crimes of Nero had he occupied a throne. While yet a child he betrayed an instinct of cruelty which excited horror; and was delighted with tormenting animals, and with violently treating his servants. It is also related that he delighted in shedding the blood of those he had debauched, and that he exercised various kinds of barbarities on the courtesans who were brought to him. Popular tradition, corresponding with several historical relations, accuses him of different homicides. It is said that he committed these murders without interest, without anger, and

* Histoire de la France, t. ii. p. 59.

without vengeance; shooting even at tilers in order to have the barbarous pleasure of seeing them falling from the tops of the houses."

These latter facts, which fortunately are very rare, prove that this terrible propensity is sometimes quite independent of education, of examples, of seduction, or of habit, and that it depends on organization alone. Indeed there are crimes of so high a degree, and accompanied with such repugnant and horrible circumstances, that it would be impossible to explain them in any other way. Prochaska relates* that a woman of Milan flattered little children, led them home, killed them, salted their flesh, and eat of it every day; and he also quotes the case of a person who, excited by his heinous propensity, killed a traveller and a young girl, in order to eat them. Gaubius† speaks of a girl whose father was incited by a violent propensity to eat the flesh of man, and who for this purpose committed several murders. This girl, though separated from her father for a long time, and though educated carefully among respectable persons, who had no

* Opera Minora, tom. ii. p. 98.

† Oratio Prima de Regimine Mentis quod Medicorum est.

relation to her family, was overcome by the inconceivable desire of eating the flesh of man.

Some idiots manifest this propensity to kill or to destroy. An idiot, after having killed two children of his brother, came smiling and announced the action to him. Another, excited by anger, murdered his brother, and intended to burn him openly and ceremoniously before the house. A third, according to Herder, after having seen a hog killed, thought he had a right to murder his fellow-creatures, and actually cut the throat of a man. We ourselves have seen in prison a young man whom nobody considered as silly, and who without any motive killed a child. Different questions were put to him, and he was threatened with various punishments in order to obtain a knowledge of his motive; but he only answered and incessantly repeated, that he saw nothing but black: "Whoever," said he with a lamentable voice, "was not present cannot believe me—God will pardon me." At Fribourg, in Brisgau, we saw a young man of fifteen years of age confined in prison because he had set fire to nine houses successively; he even helped to quench the fire; and, on one occasion, he

saved a child who was nearly destroyed by the flames. When the fire was extinguished he thought no more of it: his conduct was therefore excited only by some bestial instinct: indeed he was half an idiot.

Certain madmen are alienated only in respect to the propensity to murder. At Berlin, Mr. Mayer, surgeon of a regiment, showed us a soldier whose body was very irritable and much weakened by the loss of his wife: he suffered every month a fit of violent convulsions; he felt their approach; and at the same time had an immoderate propensity to kill: then he begged instantly to be loaded with chains; but at the end of several days, the fit and the fatal propensity diminished; and he himself fixed the period when without danger he might be delivered from his chains. At Haina we met with a man who, at certain periods, felt an irresistible desire to maltreat other persons: he also knew his unfortunate propensity, and begged to be loaded with chains till his fit was over. A melancholy person having seen the execution of a criminal, the spectacle produced in him so violent an emotion that he was suddenly seized with a propensity to kill. At the same time he preserved the strongest

aversion to such a crime; weeping bitterly, he described his deplorable situation with an extreme confusion; he struck his head, wrung his hands, exhorted himself, and cried to his friends to take care and to fly; and he thanked them if they resisted and menaced him.

Pinel has also observed in various mad persons the fierce impulsion to destroy: and he speaks of one who did not show any mark of alienation in respect to memory, imagination and judgment, but who confessed that, in his narrow seclusion, his propensity to murder was quite involuntary and utterly irresistible, and that his wife, notwithstanding his tenderness for her, was near being immolated, he having time only to warn her to fly. In his lucid intervals he made the same melancholy reflections, he expressed the same remorse, and he was disgusted with life to such a degree that he several times attempted to put an end to his existence. "What reason," said he, "have I to cut the throat of the overseer of the hospital who treats us with the greatest humanity? yet in the moments of my fury I feel a desire to attack him in the same way as other persons, and to thrust a dagger into his breast."

Another madman for six months in the year suffered periodical fits of fury: he felt the decrease of the symptoms, pointed out the periods when the danger was over, and begged those about him not to let him free if he felt an incapacity of governing his blind impulse to destroy: in his calm intervals he confessed, that during his fits of fury it would be impossible for him to restrain it; that if he met any one it appeared to him that he saw the blood circulate in the vessels of those persons, and that he felt an irresistible desire of sucking it, and of tearing their limbs with his teeth in order to suck it more commodiously. Pinel relates also the history of a young alienated person who every morning felt a fit of mania, during which she tore all that fell under her hands, and committed every sort of violence against all who came near her, so that they were obliged to restrain her by a strait jacket; yet in the afternoon she repented of the actions of the morning, and despaired of being pardoned. Pinel quotes another example of a monk whose understanding was alienated by devotion, so that he thought he had one night seen the Virgin Mary surrounded with a choir of angels and happy spirits, and had received

an express order to kill a certain person whom he considered as an infidel; and he would have executed his project had he not betrayed himself by various actions, in consequence of which he was shut up. The same author speaks also of a certain credulous vine-dresser, whose imagination was so violently shaken by the sermon of a missionary, that he thought himself and his family were damned to everlasting pains, and considered the baptism of blood, or martyrdom, as the only means of saving them. He therefore first endeavoured to murder his wife, who, with difficulty escaped; then he exercised his insanity in very calmly killing two of his children in order to procure for them eternal life; and when confined to prison in order to be judged, he cut the throat of a criminal who was with him in the same room, still with the intention of doing some expiatory action. His alienation being proved, he was condemned to be shut up in the Bicêtre for life: there long solitary detention exalted his imagination; and because he had not been executed, he fancied himself the Almighty, or, according to his own expressions, the fourth person of the Trinity, and that he was sent to save the world by the baptism of

blood. Having been confined during ten years, and being now continually calm and quiet, he received permission to converse with the other convalescents in the court of the hospital. He passed four years tranquilly in this way, and his healthy state seemed to be restored, when he suddenly manifested his former superstitious and sanguinary ideas. The day before Christmas, he conceived the project of doing some expiatory sacrifice by killing all those who might fall under his hands: he consequently got a shoemaker's knife, and at the moment when the keeper went the rounds, he gave him a thrust from behind which fortunately slipped over the ribs; he cut the throats of two other madmen; and he would have continued his homicide had he not been arrested by force.

These and many similar examples, observed in the healthy and diseased state of man—in idiots and madmen, prove evidently that the propensity to kill and destroy is innate, not only in animals but in man. Does not, indeed, the whole history of mankind confirm this assertion? In all ages the earth has been drenched with blood.

It is now to be examined with what view nature has created this propensity. We

cannot imagine that this propensity is innate in order to murder man. Carnivorous animals are endowed with this propensity, but they do not kill other individuals of their own kind: they kill other animals in order that they themselves may live. In what then does the food of man consist? He lives on other animals; and therefore he must kill them. Thus it may be questioned whether this propensity determines the sort of food, that is, flesh? Gall thinks so: I do not. It is certain that the propensities are in relation to the whole nature of animals, and that the propensity to kill is in relation to the food of every species of animals; but the power which desires to kill is not the same as that which chooses flesh. One special faculty produces the propensity to kill, and another faculty makes choice of flesh. On this account, there is no proportion between the propensity to kill and the want of food. Some animals kill more than is necessary for their nourishment. Some persons like meat, but they cannot kill any animal; other persons have no reluctance to kill, and yet prefer vegetables for nourishment. Children, in general, have this propensity more energetic than adult persons; yet they prefer fruits to

meat. Hence it must be allowed that this propensity is necessary to carnivorous animals; not that they are carnivorous because they have this propensity.

It remains still that we should examine what is the essential nature of this faculty? I think that its sphere of activity is more extended than the instinct to kill. It seems to me that this faculty produces the propensity to destroy in general, without denoting any object. Destruction may be applied to inanimate things, to animals, or to man; and in this signification, this faculty may be necessary and destined from creation. It must certainly be granted that throughout all nature one being lives upon another, that violent death is an institution of nature, and that there are animals of prey among all orders of animals. Now if nature had created animals which ought to live upon meat without giving to them, at the same time, the instinct of killing animals, it would be contradictory and absurd. Moreover, nature has even taught carnivorous animals to kill others in the most certain and sudden way, that is, by wounding their neck at the place of decussation. Sometimes it is necessary to destroy what is useless in order to replace it.

by what is useful : and there are many things which are relatively hurtful, which we are provoked to destroy. In this sense it is lawful to destroy others in order to save ourselves ; and in this sense destruction is not only permitted by justice, but it is even rewarded as a virtue. On the contrary, whenever this faculty destroys what ought not to be destroyed, an abuse of it takes place ; as, in murdering and assassinating man, in setting fire to houses &c.

This faculty then produces the propensity to destroy, in general, without determining the object to be destroyed, or the manner of destroying it. This faculty gives the propensity to pinch, scratch, bite, cut, break, pierce, devastate, demolish, ravage, burn, massacre, strangle, butcher, suffocate, drown, kill, poison, murder and assassinate. Gall formerly called the organ of this faculty the organ of murder, because he found it much developed in two murderers ; but it is evident that a name cannot be given to any faculty according to its abuse. It is true that the organs can be discovered only when they are extremely developed ; and in the highest state of developement many faculties produce abuses. Such was the origin of this too limited term,

erroneously derived from the abuse of a faculty of which the well regulated employment is, like that of all other faculties, essential to life. I think that the name organ of the propensity to destroy, or of destructiveness, is the most general and the most conformable to the sphere of activity of this faculty. We are convinced, by a great number of observations, that the seat of this organ is on the side of the head immediately above the ears.

VII. ORGAN OF THE PROPENSITY TO BUILD,
OR OF CONSTRUCTIVENESS.

Gall observed that those who had a particular disposition to mechanical arts presented a face of somewhat parallel form, that is, a face as large at the temples as at the cheeks; consequently that a greater disposition to mechanical arts is indicated by the developement of the brain at the temples. He found this sign in great mechanics, architects, sculptors and designers. The skulls of animals which build, and those of others which do not build, present a remark-

able difference at the place where this organ is situated ; for instance, the skulls of rabbits and of hares: accordingly it is known that rabbits build burrows, while hares, which in general resemble rabbits, lie in the field. In the beaver, marmot, field-mouse &c. this organ is distinctly expressed.

It seems to me that this faculty produces every thing that may be called construction. By means of it birds build nests for their young, rabbits and other animals make burrows, and the beaver its hut. I think that in mankind all propensity to construct, from the huts of savages to the palaces of kings, and the temples of God, is the result of this faculty. It produces, according to my opinion, fortifications, ships, the engines of war, of manufactures and commerce, instruments of all kinds, furniture, clothes, fashionable merchandises and toys. This faculty is essential not only to every mechanical profession, but to all that, in any way, require construction, as the arts of drawing, engraving, writing, carving and sculpture. Lock-makers, watch-makers, joiners, cabinet-makers, turners &c. are directed by this faculty. Thus it seems to me that the propensity to construct, or constructiveness, is the special fa-

culty of this organ, which does not however determine its object. I knew a lady at Paris, who, every time when she was with child, felt the greatest propensity to build. Too large a developement of this organ might produce too great a propensity to build or an abuse. A man, for instance, may ruin his family by building, or may employ this faculty in coining false money.

VIII. ORGAN OF THE PROPENSITY TO COVET,
OR OF COVETIVENESS.

Certain persons have a particular propensity to steal or rob. It is well known that Victor Amadeus I. King of Sardinia, pilfered every where objects of little importance. Saurin, Pastor at Geneva, though acquainted with the best principles of reason and religion, was overcome continually by the propensity to steal. Another individual of good breeding was from infancy given up to this inclination, betook himself to the military service in hopes of being restrained by the severity of its discipline; and, as he continued to steal, was in danger of being hanged: strug-

gling still against this propensity, he studied theology and became a Capucin; his propensity followed him into the convent, and he took trifles, such as candlesticks, snuffers, scissars, drinking-cups and glasses; but not concealing the stolen objects, he acknowledged that he had taken them home, that the proprietors might have the trouble of carrying them to their houses again. A person employed by the government of Austria, and established at Presbourg, had filled two chambers with stolen furniture, but he never dared to make use of it. The wife of Gaubius, the famous physician at Leyden, had in so high a degree the propensity to steal, that, when making purchases at shops, she always endeavoured to take something away; so that her husband ordered a servant to follow her, and to prevent or to compensate for her theft. Lavater speaks of a physician who never left the rooms of his patients without putting something into his pocket, as keys, scissars, knives, spoons, thimbles, buckles and boxes; but who sent them back again to their owners. Moritz, in his treatise on the human mind, relates, with much detail, the history of a certain thief, whose propensity to steal was so energetic, that even when

dying he stretched out his hand in order to steal the snuff-box of his confessor. Dr. Benard, physician to his Majesty the King of Bavaria, related to us the history of an Alsacian who was rich, and not at all avaricious, but who had a great propensity to steal: he had been educated with great care, and sometimes severely punished on account of stealing; in order to suppress which his father caused him to become a soldier, and as he continued to rob he was hanged. We have the history of the son of a very learned man, who excelled his comrades at the schools, but from his earliest infancy, stole from his parents, sisters, brothers, servants, comrades, schoolfellows and professors: all sorts of correction were useless to him; for being, as a punishment, given up to military service, he several times suffered severe inflictions, but all without changing his character: in all other respects, his behaviour was regular, but in this he was entirely indifferent to the most energetic exhortations; he looked as if he did not hear his advisers; and they were ultimately obliged to confine him in prison. The chaplain of a regiment in Prussia, a man of great intelligence and ability, could not avoid stealing handker-

chiefs from the officers at the parade: the commanding officer esteemed him much; but as soon as the chaplain made his appearance, all cabinets, presses and cupboards were shut up; for he had carried off handkerchiefs, towels, shirts and even women's stockings: yet he, with pleasure, gave back the stolen things. We saw, at Copenhagen, a prisoner who was an incorrigible thief, but who sometimes distributed the things he had stolen among the poor. Another thief was shut up for the seventh time, who confessed that it seemed to be impossible to change his behaviour; and he therefore begged earnestly to be kept in prison, and that he might have the means of earning a livelihood.

It would be easy to multiply examples of this kind almost to infinity; and they prove that the instinct of stealing is not always the effect of bad education, of poverty, idleness, or of the want of religion and moral sentiments. This truth is so generally felt that every one winks at a little theft committed by rich persons who in other respects conduct themselves well. These thefts are then said to be the consequences of mental abstraction. Moreover, the propensity to steal is proved by a state of disease. We

knew several cases in which pregnant women have felt this propensity in a high degree only during pregnancy; and certain individuals manifest the propensity to steal only if their mind be alienated. Hence it is obvious that the faculty of this propensity must be innate. We have examined the heads of a very great number of thieves; and it is unquestionable that those who manifest a great propensity to steal, present one part of the brain greatly developed, while in other persons, who are destitute of this inclination, that part is small in proportion to the other cerebral parts.

It must be inquired whether stealing is natural, and consequently whether there is a special propensity of this kind? Our opponents maintain that such a doctrine is both ridiculous and dangerous: ridiculous, because nature could not have produced any faculty absolutely hurtful to man; dangerous, because it would apologise for what is punished as crime by the laws. To this objection, Gall was accustomed to answer: no one can deny the facts which prove that theft exists; and as it exists, it was not against the will of the Creator: this propensity is also more or less energetic in different thieves, and there

are very few persons who have never stolen any thing: the organ is moreover very considerable in inveterate thieves. I, however, allow that God cannot have created any faculty which is only hurtful to mankind; and this would be the case, if there were an organ of theft,—an organ destined only to theft and robbery. On the other hand it is also certain, that there is no action without faculty and without the assistance of organization. Consequently, theft is grounded upon a certain faculty, and this faculty manifests itself by means of an organ; but theft being an evil action, is only an abuse of that faculty. This point is cleared up by analogy. Gluttony and drunkenness are the effect of a certain power, but there is no faculty solely destined to these actions: they are abuses of the special propensity, hunger and thirst. Attack and quarrelsomeness are similarly abuses of the propensity to fight. Hence, we must examine what is the special faculty which produces theft?

It seems to me, that the special faculty of this organ is the propensity to gather and acquire—to covet, without determining the object to be acquired, or the manner of acquiring it. This faculty gives a desire for

all that is desirable: money, property, animals, servants, land, cattle, or any thing upon the earth. This faculty produces egotism and selfishness; and persons endowed with it in a very high degree will never forget themselves; but the objects they desire, and their manner of acquiring them, whether by industry, commerce, gaming, or stealing, depend on the influence of all the other faculties. It is in consequence of this faculty also, that we ask “what is this or that object good for?”

This faculty is essentially necessary to man and animals, because their subsistence depends on it. By means of this faculty also; in my opinion, man and animals make provision for the future. The activity of this propensity may indeed be more energetic than is necessary. We have accordingly seen that some species and some individuals of carnivorous animals kill more than is necessary to nourish themselves, and that they delight in killing animals which they do not eat. In the same way, animals and man not only gather what is useful and permitted, but sometimes take away what belongs to others, and that of which they cannot make any use. These latter actions then constitute abuses;

and have different names, as usury, plagiarism, fraud, or theft. Thus, after having determined the special faculty of this organ, and after having explained the possibility of its abuses, it can no longer be said that it is dangerous to admit such an organ. This organ is situated at the upper part of the temples on the anterior inferior angle of the parietal bone.

IX. ORGAN OF THE PROPENSITY TO CONCEAL, OR SECRETIVENESS.

Gall calls this organ that of cunning: he ascribes to it cunning, prudence, the *savoir faire*, the capacity of finding means necessary to succeed, hypocrisy, lies, intrigues, dissimulation, duplicity, falsehood; in poets the talent of finding out interesting plots for romances and dramatic pieces; and finally the slyness of animals. In all individuals remarkable for such actions, a larger development of this organ is certainly observed. It is situated in the midst of the side of the head above the organ of the propensity to destroy. Gall first observed this organ in a person

who had many debts, but who had the address to conceal his real situation, so that his creditors could have no knowledge of each other. Hence it is evident that Gall observed only the various functions of this faculty, but did not determine the special faculty itself. Hence also he complains in respect to this, as to every organ, that he does not know its sphere of activity. According indeed to this manner of proceeding, it is scarcely possible to determine the sphere of activity of any organ, because the functions of the faculties are infinite. I have mentioned that it is necessary to determine the special faculties without considering the objects upon which, and the manner in which, they act. What is then the special faculty of this organ?

If I consider the faculty of the person in whom this organ was first observed; if I examine the manners of sly animals, and consider what in them is sly; and more especially if I consider the external behaviour of man and animals, when they exercise functions of this kind, it seems to me, that the special faculty is the propensity to be clandestine in general, to be secret in thoughts, words, things or projects. The fox is careful not to be observed; the cat, watching a mouse, moves

not a single limb; sly animals in general, if pursued, hide themselves dexterously; a dog conceals his bone: and cunning persons conceal their opinions and intentions, and sometimes manifest an opinion opposite to their own. Hence, the special faculty seems to be the propensity to conceal without determining the object or the manner of concealing. The uses and abuses of this faculty have these various names; but the propensity to conceal is common to all its manifestations.

GENUS II.—*Sentiments.*

After mere propensities follow another kind of faculties which I call sentiments. Several of them are common to man and animals: others are proper to man. I shall first consider the former.

X. ORGAN OF SELF-ESTEEM.

This is one of the faculties which are generally attributed to external circumstances; and no one has thought of an organ on which its manifestations might depend. Sometimes however pride, or a great opinion of their own persons, is observed in individuals who have no influence over others, either by birth, fortune, or personal talents. Gall first found this organ in a beggar: in examining the head of this person, he observed in the midst of the upper posterior part of the head, an elevation which he had not before observed in so high a degree: he asked him the cause of his mendicity; and the beggar accused his pride as the cause of his present state, he having considered himself too important to

follow any business: he therefore only spent money, and did not think of earning a livelihood. We have a great number of proofs as to this organ, and can establish its existence. Proud persons and those who, alienated by pride, imagine themselves to be emperors, kings, ministers, generals &c. possess it in a high degree.

This faculty gives us a great opinion of our own person—self-love or self-esteem. Its too great activity is the cause of various abuses, as pride, haughtiness, and even of disdain, contempt, presumption, arrogance and insolence; and the want of it, on the contrary, disposes to humility. There are a greater number of mad men than of mad women, who are alienated by pride.

XI. ORGAN OF LOVE OF APPROBATION.

Persons who are fond of being caressed, honoured and applauded, in short, who are ambitious, have posteriorly the upper and lateral part of the head greatly developed. Gall calls this the organ of ambition or vanity,

according to the object. It is called ambition if the object to which we aspire be of importance, and vanity if we endeavour to distinguish ourselves by little things. I consider the activity of this faculty in a general way. Certain animals are sensible to caresses and flattery; while others are destitute of this sentiment. It is the same with man; for some persons are fond of flattery or of applause; they wish to be distinguished and to be honoured, and with this view make use of various means—of dresses, of decorations &c. This faculty makes us attentive to the opinion which others have of us, and it loves their approbation in general without determining the object or the manner of acquiring their approbation. It may act upon things of the highest importance, upon altogether indifferent, or upon useful, or even hurtful, objects. A coachman endowed with this faculty is pleased if his manner of conducting horses be approved, and a general is elated if he be applauded by his nation for leading an army to victory.

We do not doubt of the existence of this organ. I call it, according to its special faculty, the organ of approbation. This faculty contributes much, and is neces-

sary, to society; for it excites the other faculties, and produces emulation and the point of honour. Its activity, when too strong or irregular, causes many abuses; and its want make us indifferent to the opinions of others. This faculty is more active in women than in men, and even in certain nations more than in others. There is accordingly a greater number of women than of men alienated from vanity. We have met with only one mad man alienated from vanity.

XII. ORGAN OF CAUTIOUSNESS.

Two persons at Vienna were known to be remarkable for their extreme irresolution. The upper posterior part of both sides of their heads was extremely large. This observation gave the first idea of this organ. The heads of circumspect persons, and of those who want this faculty, are very different. Circumspect animals also, as the stag, roe, pole-cat, otter and mole, and those which place sentinels to warn them of approaching danger, as the chamois, cranes, starlings

and bustards, have this cerebral part much developed. Indeed, geese, cranes &c., have not understanding enough to induce us to think, that their habit of placing sentinels is the result of any intellectual combination, but it is possible that this faculty is commanded by nature, by means of some organic arrangement. Moreover, animals which see during day-light, but which do not dare to seek their food except at night, have the upper lateral and posterior part of their heads more developed than those which go out during the day. The skull of the eagle is different in this respect from that of the horned owl, which sees both in the day-time and at night, because it can contract and dilate the pupil at pleasure. Bats also have the head large posteriorly.

The special faculty of this organ produces precaution, demurs, doubts, places sentinels, and in general exclaims continually, Take care. It considers consequences, and produces all the hesitations expressed by *but*. When too active it causes abuses, as uncertainty, irresolution, unquietness, anxiety, fear, melancholy and hypochondriasis. Anxiety and fear result from a too great activity of circumspection. The want of cautiousness on

the contrary modifies the actions of the other faculties so far that these act according to their own nature without being restrained by circumspection; and the result is what is called levity or inconsideration.

Thus this faculty is necessary to our preservation, and it is only its too great activity, like that of every other faculty, which causes abuses. A great degree of cautiousness predisposes for instance to the disease of suicide: —I say, it predisposes to suicide, but it is not the only cause of that crime. This and the preceding organ are commonly more developed in females than in males, probably because they are obliged to exert greater care with reference to their progeny, or in order to supply in them what is wanting as to force.

XIII. ORGAN OF BENEVOLENCE IN MAN, OR OF MEEKNESS IN ANIMALS.

For a long time Gall did not think of placing goodness of heart in the brain. A family at Vienna, however, having often praised the goodness of one of their servants,

and told Gall, that he ought to mould his figure in plaster, he at last actually did so, and observed a considerable protuberance on the superior middle part of his forehead. This organ was afterward confirmed by numerous observations; for it is very easy to examine and verify it both in children and in adult persons. This organ may also be proved by reference to animals, either in comparing different species or different individuals of the same species. Thus several kinds of animals are naturally meek, as the roe, goat, sheep, while others are wild, savage and mischievous: so also some dogs, horses, cows &c. are meek and familiar, while other individuals of the same kind bite, kick &c. The mild and good-natured animals, then, have the place of their forehead corresponding to the organ of goodness in man elevated and prominent, while the ill-natured present a hollow.

This faculty, although it exists in animals, is greatly magnified and ennobled in man. In the greater number of animals, it is restrained to a passive goodness, but in man its sphere of activity is very considerable. It produces in man goodness of heart, kindness, peacefulness, mildness, benignity, & benevo-

lence, complaisance, clemency, mercifulness, compassion, humanity, hospitality, liberality, equity, cordiality, urbanity, in one word, *Christian charity*.

ON THE SENTIMENTS WHICH ARE PROPER
TO MANKIND.

Hitherto we have considered man so far as he is animal. All the organs and special faculties I have spoken of are common to man, quadrupeds, birds &c; and in this respect man is even the most perfect of them all: he possesses all those faculties which are more sparingly distributed among different kinds of animals. Besides this prerogative, every faculty is susceptible of many more modifications, and its energy is greater in man than in animals. Moreover, man is endowed with sentiments which constitute the human character, and of which animals are entirely destitute. Till the present time, no system of philosophy has thus clearly indicated the line of demarcation between man and animals. It was for a long time believed that man differs from animals by being endowed with memory, judgment and imagination; but a great number of facts prove that animals possess all these faculties. Others again consider reasoning as a particular attribute of human nature.—I shall here treat only of the sentiments proper to man; and in speaking of the intellectual faculties, I

shall also point out which of them are common to animals and man, and which are peculiar to mankind.

XIV. ORGAN OF VENERATION.

In his examination of the actions of man, Dr. Gall visited churches in order to observe the configuration of the heads of those who excelled in devotion. He first observed that the heads of those who prayed with the greatest fervour were bald: but it is evident that the bald state of the head does not produce devotion; for every bald man is not pious, and though women do not grow bald, yet many of them are devout. Gall observed also, that the heads of these pious men were very elevated: Lavater had made the same observation.

An objection made to this organ is, that if there be an organ of religion, there is no occasion for revelation. But it is easy to prove that this objection is false: first, there were systems of religion before revelation; Cicero says expressly, that there is no nation, no people, who do not adore a Deity; Plutarch observes, that there is neither town nor village in the world without a God;

Aristotle, Plato, and all the ancient philosophers make the same remark; and even the fathers of the church have commented on this truth, in order to prove that the belief in a God is innate. We only add that this manifests itself by a certain organization. Thus the sentiment of religion has existed long before revelation. Besides, all nations have not yet received revelation, and yet these nations manifest religious sentiments. Moreover, as revelation was to be given to mankind, was it not necessary to prepare man, or to make him capable of receiving it? Who would endeavour to make any animal inferior to man acquainted with revelation? For it is a general law, that neither man nor animals can be instructed, or educated, if the respective faculty be not innate: dogs do not learn religion any more than mathematics. Hence, man must be prepared to receive the former as well as the latter; and on this account he has received a particular organ of veneration. Revelation then has only regulated the religious sentiments and ideas which previously existed. I think with Bishop Butler * that "Christianity is a re-

* Analogy of Religion, p. 180.

publication of natural religion, and that, which is material, it teaches natural religion in its genuine simplicity."

Gall speaks of this organ under the name of religion, of theosophy, or even of morality: but these expressions are very vague, and far from indicating any special faculty; and they designate a greater sphere of activity than that of this particular organ. I disapprove of the name "theosophy;" for we cannot flatter ourselves that we know the nature of God; we can only say what God is according to our conceptions: in other words, all the superior faculties of man, elevated to the highest degree, are attributed to God;—but God may possess many other faculties of which we have not the slightest notion. We can speak only of a Supreme Being, without determining his nature.—I dislike also the name, "organ of religion," because that expression has different significations: it sometimes denotes particular acts and ceremonies by which God is venerated: and sometimes it designates also the morality of our actions. We have, however, established as a principle that the organs cannot be named according to any action.—Finally, the name "organ of morality" is still less applicable;

for worshipping is only one part of morality. It is also known that one man may be religious without being just, and another may be just without being religious. It remains therefore to be examined, what is the special faculty of this organ. This faculty, then, constitutes a sentiment, and not an idea. Gall accordingly observed this organ first in persons in the act of adoring God; and according to all my observations it seems that its special faculty is the sentiment of veneration, without determining its objects or its manner. It is by this faculty that man adores God, or venerates saints, persons and things. Experience also proves my assertion, that this faculty does not determine the object to be venerated, nor the manner of venerating. The ancient nations admitted a greater or less number of gods; and, even at the present time, different nations and different persons have different ideas of God, according to their national creeds, and their intellectual faculties; and they venerate him accordingly. We consider this organ as determined. It is situated in the midst of the upper part of the head some way before the crown.

XV. ORGAN OF HOPE.

It seems to me that there is a particular sentiment of hope. Gall considers hope as belonging to every organ; but I think there is a difference between desire or want, and hope. Every faculty, being active, produces desire: therefore even animals desire; and while the respective organ is active, they wish the satisfaction of their desires; but I do not believe that they have the sentiment of hope. I consider this sentiment as proper to man. No other faculty can produce hope or the inclination to believe and to expect; and therefore I admit a particular organ for manifestations of this kind. This sentiment is indeed necessary in almost every situation; it gives hope in the present as well as of a future life. In religion it is called faith. Persons endowed with it in too high a degree are credulous. The organ of hope seems to be situated on the side of that of veneration; but it requires future examinations, before it can be admitted; though I have many observations which support this organ.

XVI. ORGAN OF IDEALITY.

It is a proverb that a poet must be born ; and it is also certain that the heads of great poets, though not necessarily of versificators, are enlarged above the temples in an arched direction.—Now it is impossible that poetry, in general, should be confined to one single organ ; and I therefore think that the name organ of poetry, given by Gall to this organ, does not indicate its essential faculty, but that it is necessary to determine what is essential to all kinds of poetry ; for this common faculty of all poets then must be the special faculty of this organ, and the combination of this with the other faculties must determine the species of poetry which each poet may produce. It can neither be the faculty of versification, nor that of rhyming ; for some authors write in prose, and yet their expressions are really poetical ; while others make verses which however contain no poetical thought. Rhyme is still less essential to poetry, for among the ancients it was entirely unknown, and among the moderns poetry is not always rhythmic. It seems to me that in every kind of poetry the sentiments are

exalted, the expressions warm, and that there must be rapture, inspiration—what is commonly called imagination or fancy. I observe moreover, that in all persons this faculty gives a peculiar tinge to all other faculties: it makes them in every thing aspire to ideality. It is a sentiment, and if I may so speak, the opposite of circumspection: it renders us enthusiasts, while circumspection stops our career by saying, Take care. I call this organ that of Ideality.

I have here to mention certain curious observations without being capable of determining their peculiar nature.—We have observed that if the part of the head, above the organ of ideality and a little backward from it, be very much developed, the persons are disposed to mysticism, to have visions, to see ghosts, demons and phantoms, and to believe in astrology, magic and sorcery. I cannot say, whether this is a particular organ, or a greater developement of the organ of hope, or of that of ideality, or of both together.

XVII. ORGAN OF CONSCIENTIOUSNESS.

I think also that there is a particular sentiment of just and unjust, right and wrong; and that a particular organ of justice must be admitted. No animal has this faculty; and its activity is very different in man: some individuals being almost destitute of it, while others possess it in a high degree. It produces only the sentiment of justice without determining what is just; for particular determinations, as to justice, depend on the other faculties with which this sentiment is combined. A person who combines justice with some propensity of the lower order calls that just, which another person, who possesses justice combined with goodness or veneration, calls unjust.* I shall afterwards give a farther elucidation of the mutual influence of the faculties. This faculty produces the sentiment of duty, and constitutes what is called conscience and remorse.

Gall thinks that there is no organ of con-

* “ All the ways of a man are clean in his own eyes, but the Lord weigheth the spirits.” Prov. xvi. 2.
“ Every way of a man is right in his own eyes, but the Lord pondereth the hearts.” Prov. xxi. 2.

science ; but considers it as the result of the opposition of the dominant character of a person to his particular actions, and, according to him, there are as many consciences as faculties. He even speaks of a good and of a bad conscience ; the good conscience being the opposition of the good qualities to a particular action, and the bad conscience being the opposition of the bad faculties to a particular action ; in this respect admitting bad faculties. If therefore a good-natured man commit a fault or offend another, he repents, and his conscience torments him, because he has acted in opposition to his natural character. On the other hand a usurer and a libertine are sorry for having neglected a good opportunity,—the first, of deceiving, the second, of seducing some innocent person. Gall gives to this opposition of the dominant character to any action the name Natural Conscience ; and asserts that we cannot trust to the natural conscience, but that it is necessary to establish some positive conscience, that is, to determine what is to be done and what is to be let alone, without considering what any individuals may desire. Therefore it is said, Thou shalt adore one God ; thou shalt not kill ; thou shalt not steal, &c.

It would appear then that if the assertion of Gall were true, every organ ought to produce repentance whenever any action was in opposition to the natural dominant character of the acting person; but it does not seem to me that a criminal feels repentance for having done any action which may be good in itself, and not hurtful in respect to the criminal. If a criminal give to the poor a small part of his booty, does he repent having done so? Certainly not, unless he is betrayed by it. Gall asserting that inveterate criminals do not feel any repentance is in contradiction with himself. Besides, in saying that usurers repent of having neglected a good opportunity of deceiving others, Gall confounds repentance or remorse with the being sorry for or being displeased. It seems to me that he commits a fault similar to that of those who confound inclination or propensity with will; for though every cerebral organ manifests a desire, a propensity, yet every organ does not produce will. In the same way every organ, not being satisfied, or being disagreeably affected, produces pain, or sorrow, but every organ does not produce repentance or remorse. Thus I maintain

that no sentiment common to animals and man produces repentance.

It may be asked whether repentance be the same as will? The answer must be negative; for will is the effect of the understanding, while repentance or remorse is the effect of the mind in the signification I have adopted. The latter is a sentiment independent of understanding, nor is there any proportion between conscience and understanding. I am of opinion that repentance, remorse, or conscience, must be attributed only to the faculty of justice and duty. In conformity with the preceding considerations, I also disapprove of the division of the conscience made by Gall into natural—good or bad, and artificial or positive. I divide it, 1st, into *natural* or *absolute* conscience, which is the effect of justice combined with all the other faculties proper to mankind, while all the faculties common to man and animals are held in subordination. 2d, Individual, particular, or relative conscience, which results from the justice of every one combined with his other faculties. 3d, Into positive conscience, which is fixed by legislation, whether divine or civil, as by the commands,

Thou shalt not eat meat on Fridays or Saturdays; thou shalt go to church every Sunday &c. Thus I admit a particular organ of justice, and it seems probable that it is situated on the sides of the following organ.

XVIII. ORGAN OF FIRMNESS.

Dr. Gall observed that persons of a firm and constant character have the top of the brain much developed. Lavater had distinguished the same configuration in persons of an immoveable character. The special faculty of this organ is difficult to be determined; and its effects are often called will; but this will is not the moral will which is necessary to liberty. It is true, that persons endowed with a greater developement of this organ say commonly, "I will," in the same sense as the words, I want, I desire, I insist, I command; but it is obvious that they then apply the word without any strict reference to the acts of volition. This faculty contributes to maintain the activity of the other faculties by giving constancy and perseverance. Its too great activity produces infatuation, stub-

bornness, obstinacy and disobedience; and its want renders men unsure, inconstant and changeable, in conformity with other impressions. We are convinced of the existence of this organ by a multitude of observations; and it seems to be situated in the midst of the feelings, in order to strengthen their activity.

ORDER II.—UNDERSTANDING OR INTELLECT.

GENUS I.—*Knowing Faculties.*

Having finished the first order of faculties—the propensities and sentiments, I shall now consider the second. The first genus of this order contains those faculties by means of which we know the existence of external bodies and their qualities. Strictly speaking, the five external senses belong, in some measure, to this genus of faculties. I have however already treated of the knowledge which man and animals acquire by their assistance; and I shall now examine the organs necessary to acquire certain kinds of knowledge which the five external senses cannot produce. The first conception which our understanding must have of external beings is no doubt that of their existence; and in order to acquire this conception, the external senses are not sufficient, although without an impression on them this conception cannot be determinate. Thus the organ which procures knowledge of external beings must be

considered as the first in respect to the order in which the faculties operate.

The knowing faculties may farther be divided into two sections.—Several make us acquainted with every individual object and its physical qualities; and others consider the different relations of various objects.

XIX. ORGAN OF INDIVIDUALITY.

Dr. Gall observed, in society, different persons who, though not always profound, were learned, had a superficial knowledge of all the arts and sciences, and knew enough to be capable of speaking on them with facility—such men as are deemed brilliant in society. He found that in them the middle of the lower part of the forehead was very prominent, and consequently that the anterior inferior part of the brain was much developed.

The cause of the tameableness of animals has long been sought; and it has been asked, whether animals are tamed by nature, or whether they are subdued and subjected to

our services by means of our understanding? It was for a long time believed, and indeed many physiologists and philosophers still think, that the tameableness of animals is solely the work of man. But this opinion is erroneous: otherwise why should it be at present impossible for man to tame the other wild species of animals? Yet we are now better acquainted with the manners of animals than two thousand years ago, and consequently we can better adapt to them external circumstances. It is indeed impossible to tame individual wild animals, for instance, one chamois, one tiger &c. but never the whole race.

The hunting tigers, for instance, of Tippoo Saib, which were brought to the Tower of London after the fall of Seringapatam, had been tamed for the cruel purpose of the chase; but they seemed to be tame only to their Indian keeper and to persons whom they had been accustomed to, were with difficulty retained so, and ultimately became savage. The young of wild animals are always wild and fly into solitude. On the other hand, certain animals are tamed without our wishing it: and thus mice every where follow the abodes of man; and dogs, in Egypt, though considered as impure

animals, and without a particular master, yet remain in the villages and towns, never go far from the dwellings of man, and consequently are originally tame.

In animals of lower kinds, the brain, instead of ascending and forming a forehead, is even inclined downward. By degrees it becomes horizontal, is elevated, and then forms a forehead less or more developed: finally, in man it presents the most developed forehead; still, however, being sometimes in various degrees vertical, and sometimes even prominent. Animals recollect what has happened to them. An old fox which has escaped several snares, and which knows that it is watched, takes more precaution, and proceeds with greater slyness, when it approaches houses, in order to catch poultry. Any bird whose nest has been destroyed, in a frequented place, conceives the necessity of in future placing it in solitude; the construction of its second nest is also more perfect. A dog resists its instinct to run after a hare, because it recollects the beating which on that account it formerly received. Similar facts might be infinitely multiplied; and it is consequently evident that the actions of animals are not subjected to an absolute

necessity, but that animals are, in a certain degree, susceptible of education, partly by the organ in question, and generally by the faculties situated in the whole of the forehead.

What is then the special faculty of this organ, and what its sphere of activity?—Persons endowed with this faculty in a high degree are attentive to all that happens around them, to every object, to every phenomenon, to every fact; and hence also to motions. This faculty neither learns the qualities of objects, nor the details of facts; it knows only their existence: the qualities of the objects, and the particularities of the phenomena, are known by the assistance of other organs. This faculty moreover has knowledge of all internal faculties, and acts upon them. It desires to know all by experience, and consequently it puts every other organ in action; it wishes to hear, see, smell, taste and touch, and to know all the arts and sciences; it is fond of instruction, collects facts, and leads to practical knowledge.

I call this faculty that of *Individuality*, because it knows not only the external world in general, but also, each object in its individual capacity. This organ is early de-

veloped in children, because they are obliged to acquire knowledge of the external world. By this faculty, children are attentive to every object and fact, and in a short time make an immense number of observations. We consider this organ as proved by facts. Its place is already indicated.

XX. ORGAN OF FORM.

Dr. Gall sometimes speaks of an organ of the knowledge of persons. Being desired to examine the head of a young girl who had an extreme facility of distinguishing and recollecting persons; he only found in her the eyes pushed laterally outward, and a certain squinting look. My manner of considering this faculty is the following:—the preceding faculty takes cognizance of the existence of external bodies; and the first quality, which our intellect considers in them is their form, while at the same time persons are particularly known by their form. I therefore reduce this faculty to the general consideration of form. Persons, endowed with it in a high degree, are fond of seeing

pictures, and if they make collections, they collect portraits. Crystallography is the result of this faculty; and it seems to me that the conception also of the smoothness and roughness of bodies belongs to it. It is certain that vision and touch are not sufficient to make us acquainted with these qualities of bodies; they furnish only the impressions, while an internal faculty forms these conceptions. There is also no proportion between this faculty and the perfection of these two external senses.

The organ of form seems to be placed in the internal angle of the orbit; and if this part of the brain be much developed, it pushes the eyeball toward the external angle, that is, a little outward and downward. According to the external configuration of the heads of Chinese whom I have seen in London, it seems to me, that this part of the brain is developed in them.

After the existence and figure of anybody, the mind considers its dimensions or size. There is certainly no proportion either of the senses

of feeling or seeing, or of the other internal faculties, to this kind of conceptions. Sight and feeling are not sufficient to conceive the various sizes and their relations, any more than hearing is to conceive the harmony of sounds, or sight the relations of colours. The faculty of distinguishing form also differs from the faculty of size, because there is an essential difference between the idea of size and that of form: the form may be the same and the size quite different, or the size the same and the form very different: moreover, one of these kinds of knowledge may exist without the other; and there is no proportion between them. Nevertheless these two organs seem to be near to each other, though not the same.

The ideas of weight and resistance, of the momenta, of consistency, density, ductility, softness and hardness, cannot be attributed to the sense of feeling. Though previous impressions take place on the muscles, yet these peculiar conceptions are the results of an internal operation of the mind; and we

must, therefore, admit a particular faculty for these. Its organ also must be situated in the neighbourhood of the organ of form and size. I grant that this is only conjectural, but from the general proofs of the plurality of the organs, I am convinced, that these operations of the mind depend on a peculiar cerebral part, though I cannot yet absolutely determine it. The conceptions of form, size, weight, colour, are certainly as different as the various feelings of which I have spoken.

XXIII. ORGAN OF COLOURING.

The qualities of external bodies, which I have examined, are those which are most essential to them; and the knowledge of these qualities is also more important to man and animals than the faculty which makes us acquainted with colour. In speaking of vision, I have shown that vision is insufficient to bestow excellence in colouring among painters. It is true the eyes perceive the

beams of light, and are affected agreeably or disagreeably by the different modifications of light or by colours; but they do not conceive the relations of different colours—their harmony or discord, and they have no memory of them. In order to prove this assertion, we need only compare, in animals and man, the faculty of perceiving light or vision with the faculty of conceiving colours. I am not indeed certain that animals are destitute of the faculty of distinguishing colour, though they have no art of painting; for there is a great difference between producing a thing, and being capable of perceiving it. Animals have the senses of smell and taste, but they cannot produce the enjoyments of these senses; and in the same way it is possible that they perceive different colours, and their harmony or discord, without being capable of painting.

Certain persons are almost destitute of the power of perceiving colours: we know a family of which all the individuals distinguish only black and white; Dr. Unzer, of Altona, could not perceive green and blue; and a boy, of Vienna, who wished to become a tailor, was obliged to abandon this trade be-

cause he could not distinguish different colours: there are many similar examples. Those persons, who do not perceive colours, have sometimes the sense of vision very acute, and readily perceive the other qualities of external bodies, as their size and form. Indeed the faculty of perceiving the harmony of colours is totally distinct from that of form; for there is nothing more common than that a painter should be an admirable draughtsman and a vile colourist. Thus, as in man the faculty of colouring is not in proportion to the sense of sight, nor to the understanding in general, it seems evident that there is some particular faculty which perceives different colours, recollects them, and judges of their relations. This faculty is necessary to painters, dyers, enamellers, and to all those who are occupied with colours and their shades. It is by means of this faculty that certain persons are so much charmed with flower gardens, or with enamelled meadows, and with a tasteful choice of colours in dress and in furniture. Its organ is placed in the midst of the arch of the eyebrows. The external sign of a greater developement of the organ of this faculty is a vaulted and round arch of the

eyebrows. This configuration gives to the face a look of gaiety and pleasure. In the Chinese, the orbitary arch is elevated in the middle, while the eyes are depressed, and it is well known that they are fond of colouring. This faculty is generally more active in women than in men; they are more fond of colours than men are; and they exhibit this taste in their dresses. Some women even acquire a certain perfection in colouring, while in all other parts of the arts they are surpassed by men. Their eyebrows, accordingly, are more arched than those of men.

In this as in other faculties, it is necessary to distinguish the quality from the degree of activity of the faculty. There are individuals and nations who are fond of colours, but who do not feel their harmony or discord, that is, have no judgment or taste respecting them. This idea will be understood from the consideration of judgment in general.

XXIV. ORGAN OF LOCALITY.

It happened that, though Dr. Gall had always good eyes, he could not again discover places where he had been before. On the contrary, one of his fellow-students, called Scheidler, had a surprising facility of recollecting localities and particular places, and never, for instance, lost any place where he had discovered a bird's nest, but always found it again without having made any artificial marks. Gall could not find the places again, although he had been very attentive, and had had recourse to artificial indications. As, then, Gall formed various busts in plaster, he moulded also that of his fellow-student Scheidler, known to him by his excellent local memory; and he distinguished at the eyebrows, towards the mesial line of the head, a protuberance on each side which reached to the middle of the forehead. Observing afterwards every person endowed with a greater degree of this faculty, he one day met, at Vienna, a woman who had this organ so extremely developed, that her face was deformed by it; and, on speaking to her, he learned that she had the greatest

propensity to travel, that she had left her parents, at Munich, solely in order to see foreign countries, that she never lived long in the same house, because she liked change of place, and that her greatest pleasure consisted in travelling.

The pictures and busts of great astronomers, navigators and geographers, as of Newton, Columbus &c., present a great developement of this organ. This faculty caused Columbus to seek for a new continent, and it excites every zealous traveller. Bloede, of Dresden, speaks of one who had formerly been a miner, known under the name of Augustus of Schneeberg, because he was born in that town, who, with a kind of ridiculous eagerness which prevents him from staying longer than one or two days at the same place, runs every year over the greatest part of Saxony, Lusatia and Silesia: he has every day, like migrating birds, a fixed station, and brings to every landlord, who gives him relief, compliments and salutations from all his friends; and he, then, tells all the details of his last journey, and speaks with the greatest volubility, keeping, meanwhile, his body immoveable and his eyes shut: Bloede states, that this odd per-

son has really two large protuberances corresponding to those of this organ. At Torgau, in Saxony, we saw a blind man in whom this organ was much developed, and who told us that he was fond of hearing geography and travels spoken of, and that he often dreamed of foreign countries, though he had never seen them. In one word, this organ has in man been proved by many thousand facts, and we have no doubt of its existence.

Animals also must be endowed with this faculty. Without it they could find neither their progeny nor their dwellings, after they had been obliged to leave them in order to seek for food. This faculty is indeed very active in certain animals, while others are almost destitute of it; and this difference is not only perceptible in different kinds of animals, but also in different individuals of the same kind. One dog, having scarcely gone down stairs, loses the door of its dwelling, while another finds its usual abode and master from an enormous distance. Thus a dog was transported in a carriage from Vienna to Petersburg, and after six months it returned to Vienna: another dog was transported from Vienna to London, and found means

to come back, by attaching himself to a traveller in the packet-boat, and going with him to Mentz, whence he himself returned to Vienna: another was carried from Lyons to Marseilles, where he was embarked and conducted to Naples, but came back to Lyons by land: another found again his former master in Suabia, after having left his new master in Hungary &c. Similar facts prove that those persons are wrong who derive this faculty from the sense of smell; for none of the dogs here mentioned could discover any trace by smell: besides, dogs do not always return the nearest way, but sometimes make extraordinary turnings. Certainly it is not the sense of smell which leads back pigeons though transported to the distance of twenty leagues or more, confined in a sack, and prevented from seeing the country. Such too is the case with the falcon of Iceland, though it has been carefully confined: often the first time it is sent against a heron, it ascends vertically into the air, distinguishes its regions, and takes the direction of the north. It is equally impossible to maintain that this faculty is an attribute of the eyes, because there is no proportion between the energy of this faculty and that of vision.

Hence it must be attributed to some internal organization.

This faculty being innate, and being rendered active by internal excitement, explains a phenomenon observed in many animals. Certain animals, chiefly birds, as swallows, storks, starlings, quails, nightingales &c., migrate at certain periods of the year. These animals also come back, not only into the same climate and into the same country, but to the same place—to the same window, bush, chimney, or tree. These migrations do not result from want of food alone; for though it is true that the faculties are excited by external wants, and that certain birds leave one country in order to seek food elsewhere, yet the faculties must exist before they can be excited. Besides, every faculty may be active without being excited by an external want: and this is rendered evident by the circumstance that certain birds migrate before food is wanting, and come back before food is to be found. Moreover, though such birds be confined to a cage, and fed abundantly, they become unquiet at the periods of migration. It may lastly be asked, why do not all birds leave their ordinary dwelling when food is wanting? Hence it is

necessary to admit an internal and innate faculty which produces all these phenomena.

It remains to be determined what is the special faculty of this organ, and the sphere of its activity? This faculty measures space and distance, and gives notions of perspective; it makes the traveller, and geographer and landscape-painter; it recollects localities and judges of symmetry. Hence it seems to me that it is the faculty of locality in general. As soon as we have the conception of the existence of any body and its qualities, it is necessary that it should occupy a place. This faculty, then, conceives the places occupied by external bodies; and it makes locality not only known to us, but it is also fond of this kind of knowledge, and explains all the phenomena of which I have spoken. Locality cannot be the same as size, because the conception of size concerns individual objects themselves: but it is quite another sort of conception which considers the various situations or localities wherein individual objects are placed with relation to each other.

It seems to me that there is also a particular faculty which enables us to conceive order. We may have some idea of different objects without order; yet the mind, though acquainted with external objects, their qualities, and the places they occupy, has still to consider the order in which they are ranged with regard to each other. There are individuals who, in their rooms, like every article of furniture, and at table every dish, in its place, and who are displeased with any irregular arrangement of them. The Sauvage de l'Aveyron at Paris, though an idiot in a very high degree, cannot bear to see a chair or any other object in disorder; and as soon as any thing is deranged, he without being in any way excited to it directly puts it in its proper place. This sort of arrangement however is different from that philosophical method, which is the result of the consistency of ideas. The faculty, of which I here speak, gives method and order in arranging objects as they are physically related; but philosophical or logical inferences, the conception of systematizing or generalizing, and the idea of classification, are formed by the reflecting faculties. This faculty is merely fond of put-

ing the particulars in order, according to physical considerations; as, in a library, books may be arranged according to their size and form, and in natural history, animals may be classed according to their various configurations. In general, order may be applied to various other faculties—to form, size, weight, colour, words, things &c. Its organ is probably situated outward, but not far from the organs of size and space. Is cleanliness or tidiness dependant on the same faculty as order?—Does it produce also the pleasure of seeing any thing complete, because order is impossible, while the object, as a collection, is incomplete? Whatever may be objected to it, this sort of conception is different from all the preceding ones. The organ is not indeed certain; but it must be looked for.

In the same manner, the faculty of time seems to be quite distinct from any other: it may even exist without order and number. Yesterday, to-day, to-morrow, the day after to-morrow &c., constitute a succession without any regard to the number of days. There

is more connexion between order and number than between time and number, and there is more connexion between time and order than between time and number. Order is more in relation to objects, and time to facts or events. The conception of time seems to be higher in the scale, and its organ accordingly occupies a higher place in the brain; the organ of order holds the middle place; and that of number, the lowest and most external. Our natural expression of time and number proves indeed that the organs of these faculties occupy different places, and that the seat of the organ of the former is higher than that of the latter. In thinking of time, we raise up the eyes; and in ciphering we look downward and outward.—I shall afterwards speak of a faculty which examines the relations between cause and effect. This faculty supposes a succession of phenomena, and cannot, in place, be far from the proper organ of succession or of time. It seems indeed that the organ of time is situated between the organs of individuality, locality, order, tune and cause.

XXVII. ORGAN OF NUMBER.

Some individuals remarkable for their great talent of caculating excited the attention of Dr. Gall. He found even children who excelled in this faculty. Thus a boy of thirteen years of age, born at St. Poelton, not far from Vienna, in this respect excelled his school-fellows surprisingly; he learnt easily an immense quantity of numbers, made the most complicated arithmetical operations from memory, and very soon found their result: Mr. Mantelli, a counsellor of the Court of Appeals at Vienna, took a particular pleasure in the solution of arithmetical problems; and his son of five years of age did nothing but calculate during the whole of the day. In such individuals the arch of the eye-brows is much pressed downward or elevated at the external angle of the orbit. This sign is the result of a greater developement of the part of the brain situated behind this place. The portraits and busts of great calculators present the external sign of this faculty, as Newton, Euler, Kaestner, Jedidiah Buxton, Pitt &c. We have made an infinity of ob-

servations upon this organ; and we consider it as demonstrated.

What is the special faculty of this organ, and its sphere of activity? Whatever concerns unity and plurality—number—seems to belong to this faculty. Hence, its object is calculation in general. Gall often calls this organ that of mathematics, but I think that this faculty only calculates: therefore, arithmetic, algebra and logarithms belong to it; but the other branches of mathematics, as geometry &c., are not the mere results of this faculty, which, however, may be applied to different faculties, as to form, size, colour &c.

XXVIII. ORGAN OF TUNE.

It is with the organ of tune in respect to the ears, as with the organ of colour in respect to the eyes. The ear hears sounds, and it is agreeably or disagreeably affected by them; but the ear has no recollection of tones, nor does it judge of their relations: it does not perceive the harmonies of sound, but only separate sounds; and sounds, as well

as colours, may be separately pleasing, though disagreeable in combination. In treating of the sense of hearing, I have already demonstrated, that on the ear the origin of music does not depend. Besides the above-mentioned proofs that the ear is not the organ of musical perception, there exists a direct proof that an internal organ is necessary to the manifestations of this faculty; for sometimes in epileptic fits, in delirium, and syncope, certain individuals sing continually and with great precision; and then this faculty is alone active, while the functions of all the other faculties are deranged. A greater development of this organ enlarges the lateral parts of the forehead; but its form varies according to the direction and form of the convolutions. In Gluck, Haydn and others, this organ had a pyramidal form; in Mozart, Viotti, Zumsteg, Dussek, Crescentini and others, the external corners of the forehead are enlarged but rounded.

The heads and skulls of birds which sing, and of those which do not sing, and the heads of the different individuals of the same kind which have a greater or less disposition to sing, present a conspicuous difference at the place of this organ. The heads of males, for

instance, and those of females of the same kind of singing-birds, are easily distinguished by its different developement. In short, we consider this organ as established by the immense number of observations which prove its existence.

There is a striking analogy between colours and tones, and their respective organs; colours being perceived by the eyes, and sounds by the ears: there are primitive colours, and such also is the case with tones. There is an agreeable succession of colours, as there is of tones; that is, there are colours and tones which agree with one another, and others which do not. Colours may harmonize, and tones may be concordant. Lastly, the concordance both of colours and of tones may be considered by the faculties of order and number. In this manner, indeed, colours and tones are calculated, and thus are the principles of painting and music established.

XXIX. ORGAN OF LANGUAGE.

I have already mentioned the observation of Dr. Gall, that in his youth he had reason

to be vexed that while several of his school-fellows learned by heart even things which they did not understand with great facility, he had the utmost difficulty in engraving in his memory a less number of words ; and also that in those individuals who had so great a facility of learning by heart, he afterwards observed the eyes to be very prominent. He accordingly established an organ of words, the greater degree of developement of which is denoted by the prominence of the eyes. Sometimes, then, the eyes are not only prominent, but also depressed downward, so that the under eye-lid presents a sort of roll, or appears swollen; and such persons are fond of philology, that is, they like to study the spirit of different languages. Gall speaks of these two configurations as of two different organs under the names, organ of words, and an organ of languages.

It is indeed true that some persons learn easily the spirit of different languages without having a great memory of words, and that other persons easily acquire words without knowing the spirit of any language; yet it seems to me, that the memory of particular words, and philology in general, are grounded upon the same special faculty. I shall afterwards show that the judgment and memory of

any faculty are not different degrees of activity, but that judgment is only a mode of activity, and that it may exist without great memory of the respective faculty. It seems also to me, that the organ of words must have its laws as well as the organ of colour, tune, or any other faculty; and these laws of words constitute the spirit of language. I am satisfied of the truth of this opinion, because the spirit of all languages is essentially the same, just as the spirit of all kinds of music. The laws or principles of music, painting and language, are constant and every where the same: and they are only modified in different nations according to modifications in the structure of the organs, and to the combinations of these faculties with others. I therefore admit only one organ of language.

Before it is possible to understand the special faculty of this organ, it is necessary to consider that the internal faculties may be active by means of the organic apparatus; and a being may have an inclination, a sentiment, an idea, or reflection, without manifesting them by any sign whatever. Man and animals, however, are destined for society; it is consequently necessary they should

communicate and understand their sensations, ideas and reflections; and this communication can take place only by signs.

These signs are either natural, or arbitrary and artificial. The natural signs are conformable to every faculty. All beings endowed with the same faculty manifest its activity essentially in the same manner, and all beings endowed with the same faculty understand its natural manifestations: but several beings, all endowed with different faculties, could not communicate their sensations. This law is common to man and animals. Animals, which have a certain faculty in common with man, understand his natural manifestations. The dog, for instance, perfectly understands the signs of anger in his master, because the dog possesses the faculty which produces anger; but the dog will never understand the natural signs of the adoration of God. Hence, it is also obvious that individuals of the same kind understand these natural signs better, if their respective faculties are of equal strength.

This natural language is also known under the name of pathognomy; and under that head I shall afterwards treat of its principles. Here I only mention in general, that every

faculty, being active, involuntarily produces particular signs, which form the natural language common to man and animals in as far as their faculties are common. It is true that these natural signs produce the respective feelings; and on this account their influence is of great importance in teaching the deaf and dumb; for by means of this natural language they may become acquainted with the expressions of the various internal affections. It is, however, to be observed, that the natural signs communicate principally the propensities and sentiments, and in a less degree the different conceptions and reflections of the understanding. Natural signs indicate the activity of the different intellectual faculties, but not their determinate actions: these are indicated by the second sort of signs, which however are not understood before man and animals have had the relative determinate ideas.

The second sort of signs are arbitrary or artificial. I have mentioned that natural language is common to animals and man: artificial language is a prerogative of mankind. This language is the result of the superior intellectual faculties, which contrive and procure the enjoyments of all the other faculties,

and of which I shall afterwards treat. In order to communicate his sensations and ideas to others, man makes more use of the artificial language than of the natural, though natural language always and involuntarily accompanies the artificial. As the natural language is expressed principally by voice and muscular motion, so these parts present the most natural and most convenient means of artificial signs. Of these the voice is the most commodious; but if these means cannot be conveniently used, as in addressing the deaf, or persons at a distance or absent, we have recourse to other means, as to gestures for the deaf, and to those in sight, but not within hearing, and to written signs for persons who are absent. How little the artificial vocal signs are understood, is evident from different languages. If, moreover, we wish to communicate certain sensations or ideas to any other person, and to him alone, we are obliged to choose arbitrary and secret signs—signs which he alone understands. Hence it is evident that artificial signs do not of themselves produce any idea, but that they do so only in consequence of an arbitrary agreement.

Now the superior intellectual faculties form the conception of producing artificial signs;

and therefore the sensations, ideas and reflections must exist, before arbitrary signs can be invented in order to indicate them. It follows, moreover, that signs are multiplied and modified according to the sensations and conceptions of the mind; and hence there are as many sorts of signs as there are different faculties. There are words or signs to indicate individual objects, that is, nouns and verbs. Other words denote the qualities of the substantives; and in certain languages these adjectives are concordant to the substantives; and are susceptible of different degrees. As there is a difference between the sexes in living beings, the signs indicate also this difference, and admit of genders. The number of objects is also considered:—sometimes the number alone, sometimes number combined with order, and sometimes with order and time—as one, two, three; or first, second, third; or first time, second time, third time. There are other words again which may be substituted for substantives, whether persons or other objects, namely, pronouns, which are either personal, possessive, demonstrative or relative. Other signs denote any state of the subject spoken of, which may be a person or a thing,

and its state may be active, passive, or neuter. This state may be affirmed or denied by certain terms in a positive (indicative); conditional (conjunctive or subjunctive); or imperative manner. This state may be, moreover, considered in respect to time—whether it exist at present, or whether it be past, or whether it will take place at a future period. These words denoting the state of the subject are called verbs. There are yet other signs which explain the verbs:—a great number of them, being analogous to those which indicate the qualities of the substantives, denote places, times, numbers, quantities &c. There are also particles which indicate the different operations of the mind: some particles denote any cause: some, any connexion or conjunction; others, any condition; and others again, any time, any order, any sudden emotion of the mind, (interjections). Thus there are artificial signs for all the operations of the mind: and if all signs were reduced, in respect to etymology, to nouns and verbs, their significations would still be different, and on this account it is that their terminations have been changed.

Now there is some particular faculty which learns all these particular signs produced by

the superior intellectual faculties, in conformity with the activity of all the faculties. This faculty which learns the arbitrary signs is quite different from those which produce them; and also from those which produce the sensations and ideas. There is indeed no proportion between these different faculties. Animals do not at all produce, yet they learn, the significations of arbitrary signs, in as far as they are endowed with the respective sensations and ideas: hence tame animals learn in every country the arbitrary language of their masters: they may acquire even the significations of different sounds in different languages. Some persons excel in one kind and not in another of these faculties. It is also possible to have many ideas without possessing the faculty of learning the arbitrary signs which express them, and to know many words without having many ideas. Thus by this faculty we perceive the connexion of any sign audible or visible with the thing signified; by it we understand the meaning represented, in Algebra, by different symbols; and by it the signs by which the deaf and dumb express themselves are learnt.

Finally, in order to speak by audible signs, besides the inclinations, sentiments, ideas, or reflections, and the invention of words or vocal signs which express them, we must possess the organs of voice, and the sense of hearing. I have already stated that arbitrary language is more necessary to the manifestations of the intellectual faculties than to those of the propensities and sentiments. The organ of language accordingly seems to be placed in the midst of the knowing faculties, where it occupies a transverse situation.

Certain children who are half idiots do not speak, though they do many things like reasonable persons, and sometimes manifest a great deal of cunning; and therefore their parents, relations and even physicians, cannot believe in their partial imbecility. Now though such children be not deaf, though they can pronounce various words, yet they do not speak; and physicians often look for the cause of this in the organs of voice, as in the tongue, amygdaloid glands, palate &c.; but these parts are never the cause of the want of language. It is true that the organs of voice produce sounds, but they are not the origin or the cause of vocal language. Nay,

certain persons deprived of the tongue have yet continued to speak: * their pronunciation, of course, could not be so distinct as that of other persons, they could not pronounce certain letters; but they felt the necessity of speaking, or of communicating their sensations and ideas, and they actually did contrive to speak. On the contrary, these half idiots pronounce single words very well, but they cannot maintain any discourse; they cannot keep up their attention, nor combine their expressions. These children then are destitute of the faculty of learning arbitrary signs, because they are destitute of the intellectual faculty of inventing them.

The occasional cause of this partial imbecility is two-fold. It may be a slight hydrocephalus which distends the brain and pushes the globes of the eyes forward, in the same way as a very considerable developement of the cerebral parts situated behind the orbits. Hence, such children present the same external mark, which in the healthy state of the

* Bartholin speaks of this in a boy who lost his tongue by suppuration, produced from the small pox:—Iluxham saw the same in a girl:—Schenk, Tulpius, Richter &c., speak of similar facts. There is also a dissertation by Aurran, *De Femine Elinguis Loquela*. Argentor. 1766.

brain denotes great strength of this faculty. It must however be observed, that this circumstance does not prove the impossibility of discovering and knowing this organ, as certain adversaries of our doctrine have maintained: it presents only a difficulty which must be removed. The state of the whole organization must direct our judgment. The cause of the second species of this partial imbecility is some real defect of organization; the cerebral part endowed with this faculty being either wanting or very slightly developed; and such individuals never speak. Their eyes, instead of being pushed forward, lie deep in the orbits; and the roof of the orbits, instead of being flat, is very convex toward the interior of the skull.* Thus I admit only one organ of language; and its respective faculty produces similar phenomena in respect to languages or arbitrary

* What is to be done with such children? Those of the first kind ought in every respect to be strengthened by physical education, yet not by employing too incessantly their feelings and intellectual faculties. Sometimes with age the fibres of the brain become stronger, and resist the pressure of the water accumulated in the cavities of the brain. Too early instruction is in all cases hurtful, but it is most so to children of this kind. The disease of children of the second kind is incurable,



signs, as every other intellectual faculty does in respect to external impressions. It makes us acquainted with arbitrary signs, has memory of them, judges of their relations, and produces a propensity to the employment of these functions.

GENUS II.—*Reflecting Faculties.*

XXX. ORGAN OF COMPARISON.

Dr. Gall observed various persons, who, in order to convince others, had, in every conversation, recourse to examples, similitudes and analogies; and seldom to reasoning and philosophical argument. In them he found, in the midst of the superior part of the forehead, an elevation which presented the form of a reversed pyramid, and he named this organ according to its functions, organ of analogy. This organ is developed in all popular preachers beloved by the crowd, who speak by examples and parables, and who choose their similitudes from facts which are generally known. Indeed, in order to persuade and to affect, the speaker or orator must speak by analogy: he must bring spiritual things near to terrestrial objects, and compare them with each other.

The activity of this faculty is very important. It compares the sensations and ideas of all the other faculties; and points out their difference, analogy, similitude or identity. It compares, for instance, the functions of the

five external senses with the functions of the internal faculties; and hence it often happens, that the same vocal signs or expressions are applied to both kinds of functions, so that the same expressions are sometimes positive, and sometimes figurative. For this reason the language of every nation proves whether this organ is much or little developed in the greatest number of its individuals. If they have this faculty in a high degree, their language is replete with figure.

This faculty attaches us to comparison without determining its kinds; for every one must choose his analogies from his knowledge, or from the sphere of activity of his other faculties. He who has the faculty of locality in a high degree derives thence his examples; and another from figure, or from any other faculty in which he excels. The name and place of this organ are already indicated.

XXXI. ORGAN OF CAUSALITY.

Dr. Gall remarked, that persons who like metaphysical study have the superior part of

the forehead much developed and prominent in a hemispherical form, as Mendelsohn, Kant, Fichte and others. It is also remarkable that the ancient artists have given to Jupiter a forehead more prominent than to any other antique head; and hence it would seem they had observed that the development of the forehead has a relation to great understanding. Gall ascribes to this hemispherical configuration the love of metaphysics; but he allows that he does not know its sphere of activity.

To this I must object, first, that in this configuration are involved both the middle and lateral parts, and the special faculty of the lateral cannot be the same as that of the middle parts. It happens indeed that sometimes the middle, sometimes the lateral parts are most developed. Moreover, the name metaphysics does not designate a special faculty. Hence I ask, what is the special faculty of the lateral parts? Let us examine what is the most active faculty of metaphysicians? Their object is to investigate the origin and nature of every thing, even the nature of God, and the immortality of the soul. Though with Kant and others, I think that it is impossible, by reasoning, to pene-

trate the profundity of these subjects, it may still be examined what special faculty endeavours to do this? Metaphysicians, then, endeavour to explain phenomena; but in order to do so, it is necessary to examine the relations between cause and effect. Even philosophers who explain natural phenomena by reasoning admit some cause, and explain the rest by mental induction according to the supposed cause. Hence it seems to me that this special faculty examines causes, considers the relations between cause and effect, and always prompts men to ask, Why.

Thus the faculty of individuality makes us acquainted with objects and facts; the faculty of comparison points out their identity, analogy, or difference; and this faculty desires to know the causes of all events. Consequently, these three faculties together forming systems, drawing conclusions, inductions, or corollaries, and pointing out principles and laws, constitute the true philosophical understanding. Here the faculty of individuality must furnish a sufficient number of facts in order to permit the two other faculties to draw consequences and establish general principles. The too great activity of this faculty,

or the mania of explaining, produces abuses, and has done great harm to natural knowledge, especially to physics and medicine. It is evident that it is impossible to know final causes which yet must exist: the only thing we can know is the succession of phenomena; and if one uniformly succeed another, the preceding is considered as the cause, and the following as the effect. This latter kind of mental operation is manifested by the development of those convolutions which occupy the upper, middle and lateral parts of the forehead.

XXXII. ORGAN OF WIT.

Persons who are called witty, who write like Voltaire, Sterne, Piron, John Paul &c., have the superior external parts of the forehead elevated. Jest, raillery, mockery, ridicule, irony &c., belong to this faculty. It is asserted that wit consists in comparing objects in order to discover their similarity or dissimilarity; but the two preceding faculties also compare; and comparing in a philosophical

way is quite different from comparing wittily. Thus the essence of this faculty consists in its peculiar manner of comparing, which always excites gaiety and laughter.

XXXIII. ORGAN OF IMITATION.

There is in the brain an organ of a faculty for which Gall never would have spontaneously thought of seeking. It seems to be a faculty *sui generis*. One of Gall's acquaintance, who possessed the faculty of imitating in a surprising degree, and was indeed a perfect actor, desired Gall to examine his head, because he had a transverse furrow in the midst of it. Gall accordingly found the hollow place; but he at the same time observed before it, at the superior part of the forehead, a considerable elevation of a hemispherical form. Some time after, Gall observed also in the institute for deaf and dumb persons, an individual, who, the first time he put on a mask at the carnival, imitated perfectly well all the persons who frequented the institution; and he found the configuration of the upper

fore-part of his head to be the same with that of his acquaintance. In comparing many persons endowed with this faculty at Vienna, and during our travels, we have always found that the developement of this organ coincides with the energy of the faculty of imitation. We therefore admit this organ as demonstrated.

It seems to me that this faculty has a great sphere of activity. This organ is in general more developed in children than in adult persons; and it is also known that children learn a great number of things by imitation: they do what they see done by others; they repeat what they hear told. Is it not the same with a great number of adults? Those who possess this organ much developed do not only mention a fact or an action, but they also imitate as far as possible the gestures and voice of the persons and animals they describe. In constructive arts it gives what is called expression, motion and life.

RECAPITULATION.

Thus I have specified various faculties, and proved the necessity of admitting others. I have divided these special faculties into two

orders—and each order into two genera. The first genus of feelings contains the propensities—amativeness, philoprogenitiveness, inhabitiveness, adhesiveness, combativeness, destructiveness, constructiveness, covetiveness and secretiveness. To the second genus belong self-esteem, love of approbation, cautiousness, benevolence, veneration, hope, ideality, conscientiousness and firmness. The first genus of the intellectual faculties consists of those of individuality, form, size, weight, colour, locality, order, time, number, tune and language. In the second genus are comparison, causality and wit. The last faculty I treated of—imitation—belongs to none of the four genera, but acts upon them all. I admit, as *established*, the organs of amativeness, philoprogenitiveness, combativeness, destructiveness, constructiveness, covetiveness, secretiveness, self-esteem, love of approbation, cautiousness, benevolence, veneration, ideality, firmness, individuality, form, locality, number, tune, language, comparison, causality, wit and imitation; as *probable*, the organs of adhesiveness, hope, conscientiousness, colouring and order; and as *conjectural*, the organs of inhabitiveness, size, weight and time. I have considered in every special

faculty the necessity of its existence, its use and abuse, and the result of its inactivity. Finally, I have indicated the situation of every organ.

I again repeat, that I could here speak only of the results of the immense number of facts which we have collected. Several may complain of my not mentioning a greater number of these facts; but in reply I need only answer that were I to write as many books of cases as there are special organs, still no one could, on this subject, attain personal or individual conviction, before he had practically made the same observations. I may farther remark that the detailed narrative of a thousand cases would not improve the science more than that of a few characteristic ones which state our meaning, and show what is to be observed and how we are to observe. Self-conviction can be founded only on self-observation; and this cannot be supplied by continually reading similar descriptions of configuration. Such a proceeding may produce confidence, but not conviction. This requires the actual observation of nature.

CHAPTER IV.

ON PATHOGNOMY OR NATURAL LANGUAGE.

THE second part of physiognomical knowledge is pathognomy. We have seen from the preceding considerations, that by physiognomy is understood the doctrine which judges of the dispositions of the mind according to the form of the solid parts of the body. We have also seen, that it is impossible to know the dispositions of the mind by means of the shape of those solid parts which do not indicate the developement of cerebral parts, because there is no harmony or proportion between the different bodily parts; and for this reason, all the physiognomical signs mentioned by Lavater and other physiognomists, which do not belong to the head are quite incorrect, and even those relative to the head are only useful hints, because they concern always the shape of the whole head. Hence I repeat that our doctrine cannot be confounded with any other physiognomical system. The only physiognomical signs which we admit, are drawn from the configuration of the cerebral parts.

I shall now in a general view speak of the second part of physiognomical knowledge, *viz.* of pathognomy. It consists in the motions of the soft and mobile parts, and indicates the activity of the dispositions of the mind. From the highest antiquity, this study has been considered as very important. Solomon said, “A naughty person, a wicked man walketh with a froward mouth. He winketh with his eyes, he speaketh with his feet, he teacheth with his fingers.”* Ecclesiasticus observed, “that the heart of a man changes his countenance, whether it be for good or for evil; and a merry heart makes a cheerful countenance.”† “The envious man has a wicked eye, he turns away his face and despises men.”‡ “A man may be known by his look, and one that has understanding by his countenance, when thou meetest him, &c.”§ Aristotle, Cicero, Leibnitz and many ancient and modern writers have treated of this matter, and Lavater in particular has obtained great reputation by his observations.

This study is indispensable to anthropologists, to artists, painters, sculptors and actors.

* Prov. vi. 12, 13.

† Eccclus. xiv. 8.

+ Eccclus. xiii.

§ Eccclus. xiv. 29.

Yet till the present time, all knowledge of this kind has consisted only in detached observations, and is unreduced to principles. To them, however, it ought to be reduced; and indeed it seems to me possible to point out determinate rules according to which the activity of the faculties and their different modes of action may be distinguished by positive signs. I am of opinion, that the natural external expressions of every faculty are as determinate as the special faculty itself. Gall, in speaking of mimickry, considers the motions, gestures and attitude, only in order to prove the seats of the organs; and he is right in saying that the motions are modified according to the seats of the organs; but this consideration alone is too limited to explain all the variety of expression. This may be the cause why the greatest number of his auditors are not satisfied with his explanations of mimickry. I cannot enter into any details; but shall confine myself to general observations, in order to show with what view this study ought to be cultivated. I am obliged to do the same in respect to the subjects of some following chapters. If however circumstances should permit, I shall publish further on these subjects, which are

so intimately connected with anthropology, and seem to me to be of the highest importance.

Mimickry is divided by different authors according to their knowledge of our faculties. Engel divides mimickry into that of pleasure and pain. I divide pathognomy, in conformity with my division of the faculties of man, into that of automatic and that of animal life. I subdivide the mimickry of animal life into that of the five senses and of the internal faculties. I then consider the expressions of every particular faculty; and after this, the pathognomy of the different modes of action of the faculties. Finally, pathognomy is simple—that of every single faculty; or it is compound—the effect of the activity of several faculties together. As with regard to the faculties of the mind, there are several general ideas which concern all the faculties, such also is the case with mimickry.

GENERAL PRINCIPLES OF PATHOGNOMY.

1. As soon as any faculty of the mind is active, all the bodily parts which contribute to the performance of the respective function enter into action.

2. All motions and all activity of the auxiliary parts are adapted to the performance of the function.

3. Though the activity of only one part be necessary to any function, yet all other similar parts enter into action.

4. If any internal faculty be active, and somewhat energetic, though no function is produced, yet the external expressions take place conformably.

5. All external expressions are concordant over the whole body.

6. The external expressions are stronger or weaker according to the activity of the faculties; and they are modified in different nations, individuals, temperaments and ages; but the essential is every where the same.

7. The motions and attitude of the body are modified according to the seats of the organs.

8. External expressions are either transitory or permanent.

9. Pathognomy may be studied in respect to truth, or in respect to gracefulness.

10. Finally, pathognomy is to be distinguished from pantomime.

CHAPTER V.

PSYCHOLOGY.

I HAVE spoken of three faculties which together constitute the true philosophical understanding. One of them makes us acquainted with objects and facts; another points out their difference, analogy or identity, and a third considers the relation between cause and effect. I am inclined to conform my whole proceeding to these principles. We have collected a great number of incontestable facts; let us now reflect on them. Still I repeat that the basis of our inquiries is never to endeavour to point out what the mind is in itself. We are observers of nature, and as such we examine only the manifestations of the mind, and the circumstances under which these manifestations take place.

The mind, considered as the power of knowing, was the object of all the ancient, and is still the object of modern, philosophical systems. Our philosophy is very simple, but our philosophical conclusions differ from those of all other philosophers.

When treating of the plurality of the

organs, I have mentioned, that many ancient and modern philosophers and physiologists have divided the functions of the mind, and admitted different faculties. Yet they had no conception of the primitive or special faculties of the mind; and they considered as such only general and common faculties, or modes of the faculties. In order to understand this assertion, it is necessary to consider the difference between the faculties. I admit three kinds of faculties: general, common, and special faculties—a division which is quite general throughout all nature.

In inorganic bodies, there are general qualities, which must be specific in determinate bodies: for instance, size, figure, weight and consistence are general qualities of all bodies, and in order to indicate any determinate body, as gold, silver, iron, copper &c., these general qualities must be specified. Moreover, several qualities are common to metals, or to salts, or to earths, and these common qualities must also be specified in order to distinguish every sort of metal, salt or earth. In vegetables also there are general properties of vegetation, as, to be produced by its like, to be nourished by intussusception, to assimilate the food, to increase, de-

crease, and die; and all these phenomena must be specified in designing any particular plant, as an apple-tree, a rose-bush; while there are also qualities common to various orders of plants. Such also is the case with animals both in their automatic and animal life: their phenomena generally analogous bear also a general name; and their phenomena common to a certain order of functions are designated by a common name. Secretion, for instance, is a common function; but the secretions of saliva, bile, tears &c., are particular. Sensation is an expression which indicates the common function of the five external senses; but every determinate sensation, as of sight, hearing, smelling, taste or feeling, is special.

In the same way, all philosophers and physiologists have hitherto spoken only of general or common faculties of the mind. Thus, it is generally said that animals act by instinct, and man by understanding. *Instinct* however is only a general expression, and denotes every inclination, every internal impulsion; but the determinate impulsions or instincts, as the instinct to migrate, to gather provisions, to build or to sing, are special. Moreover, it is said that man acts by

understanding in opposition to the instinct of animals; and here we must inquire first whether animals act only and always by instinct; and secondly whether understanding indicates a special faculty.

As instinct denotes any internal impulsion, many actions of animals, as the industrious labours of insects, are certainly the result of some internal impulsion or instinct; but many animals modify their actions; in order to do so, they choose even among different motives: these actions therefore are not the effect only of an internal instinct. A dog may be hungry; but he may not eat because he fears the blows of his master: certainly this dog does not act only from instinct, but shows a certain degree of understanding; for understanding is the knowledge of our faculties and the power of modifying their actions: thus all the actions of animals are not the result of mere instinct. On the other hand, if new-born children cry, and suck the finger, they do not act from understanding. If men of great genius manifest talents without knowing that such manifestations exist—if they calculate, sing, or draw, without having seen or heard of such things having been done, does it not happen by

some internal impulse or instinct, in man, as well as in animals which sing, build, migrate, gather provisions, by a mere internal impulse or instinct? Hence understanding is not a prerogative of man in opposition to instinct in animals. Let us now examine whether understanding is a special faculty.

Understanding is an expression which designates a general faculty; and there are different determinate species of understanding. This is even the case with all the common faculties of the understanding, of which philosophers and physiologists speak; namely, with *perception*, *memory* or *recollection*, *judgment* and *imagination*. These expressions are common; but every peculiar perception, memory, judgment and imagination, as of space, form, colour, tune and number, belong to a particular faculty. If these faculties of understanding were particular ones, the person who possesses any common faculty ought to be endowed with all its particular kinds. If, for instance, instinct were a peculiar faculty, an animal which should have one instinct ought to have all instincts. If perception, memory, judgment or imagination were special faculties, any one who has perception, memory, judgment or imagina-

tion, ought to possess all kinds of perception, of memory, of judgment or of imagination. Now this is in opposition to all experience. One may have a great memory of one kind, and a very defective memory of other things. A poet possesses one kind of imagination in a high degree, but has he therefore every kind of imagination, as that of inventing machines, of composing music &c? A speculative philosopher may be satisfied with general and common expressions, which do not denote particular and determinate properties of different beings; but these general or common considerations are insufficient for the naturalist, who endeavours to know the functions and the faculties of every organic part in particular. Throughout all natural history, the expressions are the less significant the more general or common they are; and a distinct knowledge of any being requires a study of its particularities.

Moreover, affections and passions have often been considered as peculiar faculties; and philosophers have even divided the faculties into natural and factitious. I have already stated the primitive faculties such as I admit therein; have spoken of propensities, sentiments, knowing and reflecting faculties;

and in general have examined the different divisions and subdivisions of the faculties of the mind.

I shall now consider the different modes of action of every faculty, a kind of consideration which Dr. Gall has overlooked. The modes of action of the faculties of the mind are either general, that is, they may take place in every faculty; or they are common to several faculties; or they are proper to some one special faculty.

The general modes of action which may be applied to all the faculties of the mind; to propensities, to sentiments, to knowing and to reflecting faculties, are the following. Every faculty of the mind may be in a state of less or greater inactivity. There are then different expressions in order to designate these degrees; as heaviness, indifference, laziness, negligence, apathy. The complete want of activity is called imbecility, if the faculty never existed; and fatuity, if the faculty have been suppressed by any disease. Faculties, being active, may manifest more or less energy; and there are various expressions for denoting this state. To like, for instance, is a general expression; for every faculty, being active, likes or produces

some inclination, some propensity, or desire. Tranquillity and patience designate a less active state of the faculties: impatience, on the contrary, denotes a very active state: we may be quiet and tranquil in respect to one object, and impatient in respect to another. Temperance indicates the best degree of activity of every faculty; intemperance too high a degree of it. Other expressions which designate the different degrees of activity of every faculty are inclination, desire, longing, want, ardour, passion, and, in the diseased state, irresistibility. Here it is to be observed that, according to our doctrine, passion denotes only the highest degree of activity of every faculty; and therefore this expression must not be confounded with that of affection, which I shall speak of immediately. Thus the first kind of the general modes of every faculty consists in the different degrees of activity, from imbecility to passion and irresistibility.

The second kind of general mode of action is, that every faculty may be actuated harmoniously or unharmoniously, that is, every faculty may be agreeably or disagreeably affected. *Affections* then are only modes of action of the special faculties, and not at all special

faculties themselves. They are divided into two classes, agreeable and disagreeable, and every class admits of different degrees. The different degrees of the agreeable affections are called pleasure, joy and ecstasy; and those of the disagreeable affections are termed pain, grief and misery. According to these considerations, it is easy to rectify the confusion of ideas and expressions observed in various writings in respect to the affections and passions. *Passion* ought to be employed as indicating only the highest degree of activity of every faculty. The word *affection*, then, though sometimes employed as synonymous with *passion*, sometimes as designating certain special faculties—pride, ambition, friendship, hope &c., and very often as expressing the different modes of action of the various sentiments—shame, anger, fear, fright, terror &c., indicates, according to us and according to its etymology, only the modes of being affected. Hence affections are only modes of feeling, and belong particularly to certain propensities and sentiments.

The affections of propensities and sentiments may also be divided into simple and compound. Simple affections, for instance, are—anger, of the propensity to fight;—

fury and rage, of the propensities to fight and destroy;—anxiety, sorrow, anguish, fear, terror, and melancholy, of cautiousness;—pretension, pride, contempt and disdain, of self-love;—compassion, of benevolence;—contrition, repentance, and remorse, of justice. The compound affections are jealousy, of which egotism forms the basis, and which is modified according to the other organs which desire; envy, which is jealousy without benevolence; shame, the result of love of approbation combined with justice; and consternation and perplexity the result of much cautiousness, much love of approbation, and little propensity to fight &c.

In respect to the intellectual faculties there are also some expressions, as to learn, know, think and to be attentive, which belong to every one of them. Some other common expressions designate the different degrees of their activity, as perception, memory, and imagination. Gall speaks of four degrees of activity in every organ of the brain: of perception; memory or reminiscence; judgment; and imagination. Gall admits perception in every organ; while I make use of the name perception only in respect to the intellectual faculties, and of the name sen-

sation in respect to every faculty of animal life. Every faculty which has consciousness has sensation; and every faculty which perceives impressions made upon it has perception: thus, any being which feels hunger or physical love has the sensation of hunger or physical love; and any being endowed with the faculty of colouring, or which is capable of perceiving colours, has perception of them as soon as its faculty acts upon them. Thus perception is a common expression of the intellectual faculties.

It is the same with *memory* or *recollection*, which is the reproduction of perceptions. Now propensities and sentiments cannot be reproduced voluntarily, consequently it is impossible that we have any memory of them: it is only possible to remember that they have existed: as, that we have been hungry, that we have felt the propensity to physical love &c. It is possible however to renew the perceptions of the intellectual faculties, as, the impressions of form, size, colour, tone &c.; and this internal reproduction of the perceptions of external impressions ought alone to be termed *memory*. It follows that there are as many memories as perceptions, and that memory is not a spe-

cial faculty. This is also evident from the following consideration: if memory were a special faculty, he who has one kind of memory ought to have all kinds of it; but this opinion is refuted by daily experience. Thus as the perception of every faculty has its seat in the respective organ, so also the memory of every faculty resides in the organ of the faculty, the memory of tones in the organ of tune, the memory of colour in the organ of colouring &c.

Gall thinks that memory and reminiscence are only two modifications of every faculty: reminiscence being the faculty of recollecting that we have perceived the impressions, and memory, the faculty of renewing the impressions which we have perceived, and therefore a still higher degree of activity. Here, then, I must first observe that I do not think memory an attribute of every faculty of the mind; for what memory can be attributed to propensities and sentiments? Every faculty of animal life produces some sensation, and the sensations of the intellectual faculties are called perceptions; but as we cannot reproduce propensities and sentiments voluntarily, they are destitute of memory, which can belong only to the intellectual faculties. More-

over, I distinguish *memory* from *reminiscence*; for it is possible to have some reminiscence of all propensities and sentiments without memory, that is, without reproducing them. Accordingly, in respect to the intellectual faculties, we have sometimes the reminiscence of an impression without being able to reproduce the perception; for instance, we may know that we were acquainted with some particular name, we may know that we have heard some music, that we have seen some person &c., but we may not be able to recollect the name, the music, nor the person. A certain person lost, during a nervous fever, all reminiscence; but he spoke French, and was astonished to find that he had learned it; and he played upon a musical instrument without recollecting that he had had a music-master. Sometimes we repeat an air in music without recollecting where we have heard it. Thus memory and reminiscence may exist separately; and it therefore seems to me that they do not belong to every intellectual faculty. I consider memory as an attribute of every knowing faculty, and as the second degree of its activity; while reminiscence is the same degree of activity of the organ of individuality. This faculty knows

what happens in the other organs ; and if it reproduce its perceptions, it produces reminiscence in the same way as the other knowing faculties produce memory, when they reproduce their perceptions.

Gall considers judgment as the third degree of activity of every organ ; and he admits as many kinds of judgment as there are special faculties. Now, in the first place, it does not seem to me that judgment is an attribute of every faculty of the mind ; for what judgment have pride, circumspection and, in general, all the propensities and sentiments ? In my opinion, judgment belongs only to the intellectual faculties. Moreover, I cannot consider judgment as the third degree of activity ; for some individuals judge very well as soon as they perceive impressions, without possessing the respective memory ; and other persons have an excellent memory of a particular kind of impression, and a bad judgment of the same faculty. It even happens that in some individuals certain faculties are active in the highest degree, while the same persons judge badly in respect to these very faculties. Hence it follows that judgment is not the third degree of activity. Before I explain what I consider judgment

to be, I shall treat of imagination as being in reality the highest degree of activity of every faculty. *Imagination* is an internal activity of the faculties when unexcited by external circumstances; and there are as many kinds of imagination as there are special faculties. It is the same with propensities, sentiments, knowing and reflecting faculties. We are hungry without the presence of food; we feel physical love when in solitude; and certain persons are cautious, or pious, or like to play on musical instruments, to sing, to draw, to travel, to calculate, to build &c., without being excited by external impressions, nor do they repeat the impressions which they have perceived. This degree of activity then is designated by the word imagination in respect to the intellectual faculties. It is essentially the same in respect to all faculties in man and animals, in which last it is called *instinct*. Both imagination and instinct then are common expressions, and applied to different kinds of faculties, but they indicate essentially the same degree of activity, that is, some activity excited from within; for if animals sing, build, choose a dwelling &c., without rational determination and only by instinct, they act by their in-

ternal faculties. In the same way, men endowed with genius in music, mathematics, mechanics &c. act by the energy of their respective internal faculties.

Thus I think that, in respect to the intellectual faculties, there are only three degrees of activity: perception, memory and imagination. I shall now examine what, according to my opinion, judgment is. I consider judgment as a mode of action of the intellectual faculties. Propensities and sentiments have only the judgment called agreeable and disagreeable. Intellectual faculties are equally affected in an agreeable or disagreeable manner; but in them there is also some relation between the faculties and their respective external impressions; and every one who considers the relation which exists between his faculties and the external impressions, judges. In this sense, judgment belongs to all degrees of activity of every intellectual faculty, in which good or bad judgment must alone be spoken of; and any intellectual faculty may be very active without having accurate judgment. The functions of the reflecting faculties especially receive the name judgment, but their judgment essentially considered is only some mode of their action, as is that of the

intellectual faculties in general. The faculties of tune, colouring &c., perceive and know the relations of tones, of colours &c., and approve particular relations in the same way as the reflecting faculties distinguish analogies or dissimilitudes, and point out the causes of phenomena.

It is obvious that the laws between the external impressions and internal faculties are determinate, and essentially the same in individuals of the same kind, as in man; but that the actions of every faculty must be modified, and consequently also the judgments. This idea however will be farther elucidated in another chapter. Thus it results that judgment is only a mode of affection of the intellectual faculties, and not a degree of their activity; or, in other terms, that it is a mode of quality and not of quantity.

It remains for me to speak of the association of ideas, and of the associating power. Is there, then, a peculiar absolute faculty of association, of which modern philosophers speak so much?

The name association, according to my opinion, designates only a phenomenon which is quite general, and not confined only to the intellectual faculties. It is true

that one intellectual faculty, being active, excites one or several others, which then constitutes the association of ideas; but this mutual excitement takes place also with propensities and sentiments. Certain philosophers consider the association of ideas as the effect of habit, and not as a law of our nature: it must however be admitted as an innate principle. Many admit a primitive associating power which I deny: the faculties exist and are only associated. Moreover, as the energy of the different faculties varies in different individuals, it may easily be conceived why the facility, with which ideas are associated, is very different in different persons. Faculties, the organs of which are neighbouring, or which are active at the same time, will easily excite one another. Moreover, the faculties which contribute to the same function will easily excite one another, in the same way in animal as in organic life. Hence the principles of association are essentially the same as those of sympathy or consensus.

The mutual influence of the faculties upon each other explains also the principle of mnemonics, and shows their importance. It hence follows however that the same

mnemonical rules cannot equally apply to every person. One person, for instance, will more easily recollect ideas by the assistance of space, another by that of form, colour, or number, &c. This consideration ought, in its whole extent, to be employed in education. Never ought one intellectual faculty alone, but all those which are necessary to a perfect knowledge of an object, to be exercised together. I may endeavour farther to elucidate this matter by considering the opinion pretty generally believed, that every one thinks in his mother tongue. The meaning of this phrase is not distinct, and should be determined. We do not think in any language in the sense, that the language primitively produces our thinking; for the feelings and ideas exist before the signs, and therefore we may have feelings and thoughts without any sign or language. The signs are only associated to the feelings and thoughts; but as this association is extremely quick, takes place instantaneously, and corresponds to our manner of thinking, it is therefore said that we think in our native language. This fact however proves the importance of association, mnemonics, and the mutual influence of the faculties in general. The

vocal signs excite again the feelings and thoughts, and in the same way the ideas of form, size, colour, space &c., may reproduce the vocal signs; or size may excite the idea of colour, or colour the idea of order, and so on.

CHAPTER VI.

INFERENCES TO BE DRAWN FROM THE PRE-
CEEDING CHAPTERS.

FROM the preceding considerations several inferences may be drawn; which I shall speak of in the three following sections; and as they are of the highest importance in anthropology, I shall enter into some details respecting them.

SECTION I.

THE MANIFESTATIONS OF THE FACULTIES OF
THE MIND DEPEND ON THE ORGANIZATION.

It is an important question in philosophy to determine, in respect to the human mind, whether the manifestations of its faculties are dependant on the organization. I have several times stated, that we make no inquiry into the nature of the faculties of the mind; and that we observe only its manifestations and the conditions, under which they take place. In respect to a great number of the

functions of animal life, it is granted that they cannot take place without organization; and such is the case with voluntary motion, and the functions of the five external senses. In conformity with this we maintain, that all the manifestations of the mind—feelings and intellectual faculties, propensities and moral sentiments, reason and will, depend on the organization; and we establish our assertion by incontestable facts, and by reasoning founded on them. This chapter contains the proofs from reasoning, founded on facts which have been sufficiently detailed in the chapter on the peculiar organs. Let us then examine this part of psychology.

DIFFERENCE OF THE SENSES.

The manifestations of the faculties of the mind are modified in both sexes; some faculties being more energetic in men, and others in women. Do the souls of women therefore differ from those of men; or is it more probable, that the manifestations of the faculties are modified because the organs or instruments vary? According to our doctrine, certain parts of the brain are more developed in men, and others more in women; and in

that way is the difference of the manifestations of their faculties perfectly explicable. There are doubtless a great number of exceptions, in which the intellectual faculties of some women resemble those of men, and *vice versâ*.

INDIVIDUALITY OF EVERY PERSON.

The manifestations of the faculties of the mind and understanding are modified in every individual. Now is it probable that the soul of each individual differs?—On the contrary, it is said that all mankind have descended from the same original parents; and accordingly all the modifications of our faculties are easily explained by the difference of their respective organs. All animals of the same species, and all men, have essentially the same corporeal parts; and there is merely some difference of proportion and development in the different parts of the organization. These differences of the organs then produce differences in the manifestations of the respective faculties.

AGES.

The manifestations of the faculties are modified in different ages. Either then the soul changes, or the instruments of the soul are changed, and its manifestations thereby modified. The same law exists in respect to automatic and animal life; in both of which certain faculties manifest themselves earlier, and others later, according to the development of their respective organs.

RELATION BETWEEN THE ORGANIZATION AND THE MANIFESTATION OF THE FACULTIES.

Moreover it may be demonstrated, that the manifestations of the faculties exactly correspond to the developement of the organs. The faculties of the mind manifest themselves, increase and gradually diminish, in the same proportion as their respective organs are developed, increase and decrease. Again, if the organs of the faculties do not follow the natural order of increase, if their developement be either too rapid or too tardy, then the respective functions undergo the same change in their manifestations.

If the growth of the organs be incomplete, the manifestations of the faculties are equally defective. It is indeed impossible precisely to determine the degree of cerebral development, necessary to the regular manifestation of the intellectual faculties ; for these manifestations depend not only on the size of the organs, but also on their internal constitution. A brain too small, however, is always accompanied with imbecility. It is to be observed that, in general, the heads of idiots are either too small or increased in size by hydrocephalus—water collected in the cavities of the brain : but in proportion as the organization of the brain becomes more perfect, the faculties of the mind manifest themselves more distinctly ; the inclinations become subordinate ; the ideas clearer ; and the manners more significant. In respect to idiots it must be observed, that sometimes imbecility is not general, but merely partial ; and accordingly parents often, and even physicians, cannot conceive how a child should be deemed an idiot, though he answers reasonably and executes correctly many things relative to household affairs. We saw at Hamburgh a young man 16 years of age, the inferior parts of whose brain were fa-

vourably developed, but whose forehead was scarcely an inch in height, and in whom consequently the improvement of the superior parts of the brain was impeded: he had accordingly only the functions of the inferior parts: he recollected names, numbers, chronology and historical facts, and repeated them in a mechanical manner; but the functions of the superior parts of the brain, as comparison, reflection, judgment, sagacity, penetration &c. were utterly wanting in him. Even reasonable and very intelligent persons are sometimes extremely ill provided with this or that particular faculty.

If the organs have acquired an extraordinary developement, the faculties manifest themselves with particular energy. Hence the history of all times, and the languages of all nations, denote great genius by an expansion of the heads; and several ancient artists have perfectly well imitated this difference.

Children possess sometimes the same organic constitution of brain as their parents; and such children manifest the moral and intellectual faculties in the same degree. It is even observed, that the characteristic form of heads is often transmitted from generation to generation; and then the faculties of the

mind and understanding are propagated in such families during as many centuries. It is an acknowledged fact that children, who are like one another or like their parents, manifest similar faculties, as far as the difference of age and sex admits. It is the same with animal as with automatic life; and as the disposition to certain diseases, as gout, consumption, deafness, dropsy &c., is propagated from generation to generation; in the same manner, certain propensities, sentiments and intellectual faculties, even certain inferior inclinations, imbecility and the disposition to mental diseases, are transmitted from parents to children. It is known, that musical talent is sometimes hereditary in certain families; and Gaubius relates, that a girl whose father had killed men in order to eat them, and who was separated from her father in her infancy and carefully educated, committed the same crime.

From all these considerations it results, that there is so close a relation between the manifestations of the faculties and the organization, that the former must depend on the latter.

SLEEPING AND DREAMING.

The state of watching, sleeping and dreaming, proves also, that the manifestations of the faculties of the mind depend on the organization; for corporeal organs alone can be fatigued and exhausted. It is known that the operations of the soul, or of the faculties of the mind, cannot continue to act incessantly with equal energy—that rest is necessary and unavoidable; and this inactive state of the faculties of the mind is *sleep*, during which new forces are collected; and after awaking, the functions proceed with new energy.

If single organs be excited by any stimulus whatever, and enter into action while other organs are inactive, partial sensations and ideas, or *dreams*, arise. The nature of these dreams is almost always the result of certain material causes, and they are conformable to the age and organic constitution of the body. Men and women, endowed with a very irritable nervous system, find, in their dreams, impediments without end: they generally suffer pain and anxiety. This relation between our dreams and our organization, verified by an

infinity of examples, evidently proves that the manifestations of the faculties of the mind and understanding depend on the organization.

EXERCISE.

The possibility of exercising and training the faculties of the mind—education, proves also the dependence of their manifestations on the organization; for it is inconceivable how an immaterial being can be exercised.

INFLUENCE OF THE PHYSICAL CONDITIONS.

All that disturbs, excites or weakens the organization, chiefly that of the nervous system, changes also the manifestations of our faculties. It is a general observation, that the organs are weakened if their increase be too rapid; and for the same reason it is, that their functions are less energetic. This is principally to be observed at the climacterical years, or at the periods of increase, which are very important to be known in practical medicine; for the body does not grow always in the same proportion. Now each sudden increase weakens the organs, and consequently their respective functions; and

this is the case in respect both to automatic and to animal life. Girls who increase too suddenly grow pale, and undergo chlorosis; young men become consumptive &c. And such individuals, during their periods of growth, are not fit to be employed, or much to exercise their intellectual faculties: rest is necessary till the organs have acquired a state of maturity, when the faculties of the mind again operate with great energy. Sometimes the organs are too soon developed or too much exercised, and thence often results an incurable exhaustion: such early genius ultimately becomes quite ordinary.

In grown-up men and animals, the organs are still subjected to different degrees of excitement according to the seasons, temperature, food, and principally according to particular laws of the organization. Hence in animals, at different periods, we see appear and disappear their instinctive labours, their inclination to sing, to build, to gather provisions, to live solitarily or in society, to migrate &c. In man the faculties do not always manifest the same degree of energy. Who can mistake the influence of periodical evacuations, as of hemorrhoides &c.; or that of pregnancy, of digestion, of fasting, and

of all that exhausts the corporeal powers? Who can deny the influence of diseases upon the manifestations of our faculties; that of external and internal excitement, of agreeable sensations, of fine weather, of music, of dancing, and similar circumstances? Now all these influences act only upon the organization; and consequently the manifestations of the faculties depend on the organization.

Sometimes very inert and defective manifestations grow very active when excited by external or internal causes. Haller relates, that an idiot, who was wounded on the head, manifested great understanding while the wound lasted; but as soon as the wound was cured fell into his former stupidity. I shall mention only one case, extracted from a description of the Retreat, an institution near York for insane persons of the Society of Friends by Samuel Tuke: "A young woman, who was employed as a domestic servant by the father of the relater when he was a boy, became insane, and at length sunk into a state of perfect idiocy. In this condition she remained for many years, when she was attacked by a typhus fever; and my friend, having then practised some time, attended her. He was surprised to observe as the fever advanced

a developement of the mental powers. During that period of the fever when others are delirious, this patient was entirely rational. She recognized, in the face of her medical attendant, the son of her old master, whom she had known so many years before, and she related many circumstances respecting his family and others, which had happened to herself in her earlier days. But, alas ! it was only the gleam of reason : as the fever abated, clouds again enveloped the mind ; she sunk into her former deplorable state, and remained in it until her death, which happened a few years afterwards.”

Finally, as it is really possible to demonstrate the respective organs of the propensities, sentiments and intellectual faculties, it is impossible to deny that their manifestations depend on the organization.

The essential part of this principle has been known from the remotest antiquity, and a great number of ancient and modern, profane and religious, writers taught it. St. Gregorius Nyssenus* compared the body of man to a musical instrument. “It sometimes happens,” says he, “that excellent musicians

* De Hominis Opificio, c. 12.

cannot show their talent because their instrument is in a bad state. It is the same with the functions of the soul. They are disturbed or suspended according to the changes which take place in the organs; for it is the nature of the spirit that it cannot exercise conveniently its functions but by sound organs." St. Augustine,* St. Cyprian,† St. Ambrose,‡ St. Chrysostom,§ Eusebius and others, consider the body as the instrument of the soul, and distinctly teach that the soul is regulated according to the state of the body. Thus all natural philosophers and physicians, and all the fathers of the church, agree with us, that all the manifestations of the mind depend on the organization.

SECTION II.

INNATENESS OF THE FACULTIES OF MAN.

Another highly important question in psychology is, whence has man his faculties? Is man born indifferent to all action? or does he come into the world endowed with

* De Lib. Arb. † De Operibus Christi.

‡ De Off. § Hom. ii. iii. super Epist. ad Heb.

determinate faculties? Now it will certainly be granted that the faculties of automatic life, being considered as effects of the organization, must be innate, because the organization itself is innate; and all the faculties also which are common to man and animals must be innate in man as well as in animals. In general, man participating in the nature of all other beings—of minerals, plants and animals, and being therefore, as some have termed it, a microcosm, must possess all the properties common to him and other beings. Thus as the body of man consists of matter, it is subjected to all the laws of matter. Moreover, the organic life of man, and that of plants, is supported by the same means, namely, by the influence of caloric, air, light, food &c. Plants also are produced from germs, which formerly made part of a similar being; they take food, convert it into their proper substance, increase, decrease, and die. This comparison of man with plants holds true not only in respect to the healthy state, but even to the state of disease.

Let us examine whether the faculties of animal life, *viz.* those which act consciously, are also innate? These faculties may be subdivided into four orders: into voluntary

motion ; into those of the five external senses ; into propensities and sentiments ; and into the faculties of the understanding. Now according to the principle above mentioned, that when animal life presents any point of contact between man and animals these common faculties are innate, it is evident that voluntary motion must be considered as innate or given by nature. The functions of the five external senses are also inherent in the nature of man and animals : and these senses exert essentially the same functions in both. No one will attempt to prove that the five senses are the production of our will : their laws are determined by nature.

Thus the comparison of man with other beings (not only with animals, but also with plants and minerals) must be admitted, and cannot be repugnant to our feelings, because we participate of their properties. He, who imagines that such comparisons degrade mankind, should be aware that the greatest natural philosophers, moralists and divines, have maintained the same opinion ; as St. Gregorius Nyssenus, St. Augustin, Bonnet, Pascal, Condillac and many others.

As to the origin of the propensities, sentiments and intellectual faculties, there are

three modes of explaining this matter : Man and animals acquire their propensities, sentiments and intellectual faculties, either by external impressions, or by internal causes : and in this latter respect, either one or several general faculties produce all particular faculties ; or each special faculty is determinate, and given by creation.

There are a great number of authors who maintain that the faculties of the mind, instead of being innate, result from external circumstances and accidental events. “ Demosthenes,” says Helvetius, “ became eloquent because he heard Callistratus speak, whose eloquence made so deep an impression upon his mind that he aspired only to this talent.” Newton saw an apple falling, and this fall revealed to him the law of gravitation. It is observed that revolutions produce great men, &c. To these external circumstances considered as cause of the faculties of man belong society, external wants, climate, the mode of living and education in general.

By this manner of reasoning, however, the origin of the faculties is confounded either with the opportunity necessary for their activity, or with some external excitement. It is indeed certain that external circumstances

must be presented, otherwise internal faculties cannot act; but opportunities do not produce faculties. Without food I cannot eat; but I am not hungry because there is food. The same circumstances are often presented to many millions; and perhaps one single individual alone makes use of them. Revolutions make great men known, not because they produce the faculties, but because they offer opportunities and subjects necessary to the faculties. Circumstances are often very favourable to the attainment of distinction and the acquisition of celebrity; but we do not see that every individual attains an honourable place.

On the other hand, it is true that our faculties are often excited by external events, and that without this external excitement they would remain inactive. However useful therefore may be the consideration of great models, I am still convinced that in every science, in every art, in every occupation, the principles of each are easily conceived by those who in a high degree possess the corresponding faculties.

Education has been particularly considered as a cause of the faculties of the mind. According to this opinion, the minds not only

of men but also of animals are born without determinate faculties—indifferent—as *tabulæ rasæ* or blank paper; and all the instincts and aptitudes of animals, from the insect to the dog and the elephant, are the effects of instruction. Thus foxes hunt because they learn it from their parents; birds learn to sing; and man becomes man by education. It must be answered that neither in animals nor in man does education produce any faculty whatever.

If animals be susceptible of all impressions around them, so that these impressions determine their character and nature, why does every kind of animal always preserve the same nature? Why do birds hatched by those of different species imitate the habits and instincts of their parents? Why does not the hen learn to coo when she is brought up with pigeons? Why does the young duck, hatched by a hen, run towards the water? Why does not the cuckoo sing like the bird that hatched and nourished it? Why does not the female nightingale learn to sing like the male? When young squirrels and rabbits are pursued, why do squirrels climb upon trees, while the rabbits hide themselves in burrows? Why are dogs attached to their

masters notwithstanding the blows they receive, and which ought to produce the contrary effect? &c. It is true that the actions of animals are not confined solely to what their preservation requires. They are susceptible of several modifications: they modify their manners according to the situation wherein they live; and they are susceptible of an education beyond their wants. Hence monkeys, dogs, cats, rats, horses, harts &c. can be instructed to play various tricks. Still however this power of modifying their manners is not unbounded, but conformable to their nature; for pigeons and roes never can be made to hunt like falcons and dogs.

It is the same with man. If human faculties be the result of external influences and education, why does not man obtain the nature of various animals? Why does he, at all times, and in all climates, preserve his characteristic nature, and his primitive qualities? Young children pass the most of their time with their mothers and nurses, and consequently with women; yet boys and girls show, from the earliest infancy, their distinctive character, and this difference between the sexes continues for life.

If animals and men learn all their functions

from other individuals, why do several individuals excel others which have absolutely the same manner of living, and the same instruction? Why does one nightingale sing better and more constantly than another which lives in the same wood. A hunting dog, when hindered from taking a comfortable place near the fire, by his companions occupying every surrounding situation, went out into the yard and barked; immediately all the other dogs did the same; and then he ran in and took the best place near the fire: though he thus often deceived his companions, yet none of them was capable of imitating his stratagem.

Children sometimes show particular dispositions and faculties before they have received any kind of instruction: and almost every great man has shown in his infancy the character of future greatness. Themistocles, when still a child, said that he knew how to increase a state and render it powerful. Alexander would not dispute any prize at the Olympic games, unless his rivals were kings. Nero was cruel from the cradle. Pascal, when twelve years old, published his treatise on conic sections. Voltaire made verses when only seven years of age.

External circumstances are sometimes very adverse to the exercise of genius; but individuals, endowed with energy of disposition, only wait for opportunities; and often leave their parents and their profession to follow their natural inclination. Moses, David, Tamerlane and Pope Sixtus the Fifth, were originally shepherds; Socrates, Pythagoras, Theophrastus, Demosthenes, Molière and Rousseau, were the sons of artificers. Such individuals are sometimes obliged to surmount great obstacles; but they ultimately vanquish all impediments; their character prevails; and their talents assume their natural place. Sometimes such individuals, prevented by circumstances from following their inclinations, find their favourite occupation, and their most agreeable recreations, in the exercise of their most powerful dispositions. Hence peasants, shepherds and artisans, have become astronomers, poets, philosophers &c.; and on the other hand, ministers, kings and emperors, have been known to employ themselves in the mechanical arts.

All individual animals of the same kind present to us, in their talents, something particular: every young bird of the same brood does not learn to sing with the same

facility; one horse is more fit for the race than another; and sportsmen know very well that there is a great difference among dogs, &c. It is the same with mankind: children of the same parents are entirely different, though their education is uniform. How is it possible that the same education should produce all the particularities of different children. Notwithstanding the same education, every individual preserves some peculiarity in his character, in his manner of feeling and thinking: so many men, so many minds. Moreover, if education could produce faculties, why have instructors not yet found the means of conferring understanding, judgment and good qualities in general? Why are we not all men of genius! Why cannot moral and satirical discourses prevent the abuses of our faculties? Why are we obliged to lament so many errors and crimes?

From these considerations relative to external influence, it results that the internal faculties are not produced by them, but that the doctrine of external impressions as causing the faculties of the mind, may be reduced to two propositions:—Either the external impressions present some opportunity for the activity of the faculties; or they excite and

guide the faculties; but in no way do they produce them.

The second mode of explaining the origin of the faculties of man and animals is to admit an internal cause. The meaning however of those authors who do so, must be subdivided, because several authors admit one or more primitive faculties, which they say produce all the special faculties, while others maintain that every special faculty is innate. Let us first consider the doctrine, that one or several general faculties produce all other special faculties.

Attention is commonly considered as the cause of all internal faculties. The word attention has two acceptations: It, in the first place, denotes consciousness in general, and in this sense attention accompanies the activity of every faculty. Hence may it be explained why one animal or man pays great attention to one object, and very little or none to another. Hence sheep will never pay attention to philosophy nor theology; and while the squirrel and pigeon perceive a hare pass with indifference, the fox and eagle watch for it. Different individuals are attentive to different objects, even according to their sex and age; for among children, girls prefer dolls, ribbands &c., while boys take

horses, whips and drums ; and among adults, one is pleased with philosophical discourses, and another with witty replies ; one with events which touch the heart, and another with sanguinary battles. Attention in this sense is also proportionate to the activity of the respective faculty, since attention is the same as activity of the faculty, and there are as many kinds of attention as peculiar faculties.

Attention denotes also a distinct consciousness, a reflection on our sensations and actions. The aptitudes and instincts of animals, however, are certainly not the effect of this kind of attention ; for no one will maintain, that the rabbit, badger, mole, marmot, or hamster, make burrows because they have examined with attention the advantages of them ; or that the beaver builds a cottage because it has studied the laws of mechanics. Among men, geniuses burst forth unconscious of their talent. This kind of attention may excite the particular faculties, but it never produces them.

There is an ancient doctrine which teaches that pain and pleasure, desire and aversion, are not only the source of all actions, but also of all faculties : let us briefly examine it.

Pain and pleasure, desire and aversion, are general expressions, and belong to all the faculties. Every faculty, being active, desires; and man and animals desire the objects relative to their faculties. The dog has the desire of hunting, the beaver that of building. Hence the desires are as different as the faculties; and the energy and number of desires are proportionate to the activity and number of the faculties. It is the same with pain and pleasure. Every faculty being satisfied receives pleasure; and every faculty being disagreeably affected feels pain: consequently the kinds of pain and pleasure are also as numerous as the faculties. Hence one individual delights in generously pardoning offences, and another in taking revenge: one is happy in the possession of riches, and another glorious in disdaining the vanity of mankind. It follows that pain and pleasure are the result, and not the cause, of the particular faculties.

From these considerations, it results that one or several general faculties or even modes of their action are not sufficient to produce all particular faculties. Thus from the preceding negative proofs, we may conclude, that every special faculty of the mind is in-

nate, and given by creation. There are also many positive and direct proofs of the innateness of every faculty.

The first direct proofs may be drawn from analogy. By examining nature we perceive that every kind of earth, every salt, every metal, has its determinate qualities, by which we are enabled to distinguish one species from another: thus, the figure of crystallization, the weight, affinity, and other physical and chemical properties, are determinate and permanent. It is the same with plants: their general laws are fixed, and every plant has its own character. A pear-tree never bears apples, nor an apple-tree pears: we never gather figs from a vine, nor grapes from a thorn-bush. Every species of animal presents a specific character: the structure of their bodies, and all their manifestations, afford characteristics to distinguish one from another; and we can never change a cat into a dog, nor a tiger into a lamb, &c. Hence we must say with Moses, "God created all beings, earths, plants, fishes, birds, and all animals, each according to its kind."* Why then should man be excepted?

* Gen. i. 22, 24.

The faculties of man may be divided into those which are common to man and animals, and those which are proper to man. Now as long as we consider faculties which are common to animals and man, it is evident that these faculties are innate. All instinctive manifestations must be innate. Voluntary motion, and the five external senses, common to man and animals, are also innate. Moreover, if man and animals in common feel certain propensities and sentiments, with clear and distinct consciousness, we must consider these faculties as innate. Thus, if in animals we find examples of mutual inclination between the sexes, of maternal care for the young, of attachment, of mutual assistance, of sociableness, of union for life, of peaceableness, or of desire to fight, of propensity to destroy, of circumspection, of slyness, of love of flattery, of obstinacy, &c. all these faculties must be considered as innate. Let all these faculties be ennobled in man: let the animal instinct of propagation be changed into moral love; the inclination of animals for their young, into the virtue of maternal care for children; animal attachment, into friendship; animal susceptibility of flattery, into love of glory and ambition; the nightingale's

melody, into harmony; the bird's nest, and the beaver's hut, into palaces and temples, &c.: these faculties are still of the same nature, and all these phenomena are produced by faculties common to man and animals. They are only modified and ennobled in man by the influence of superior qualities, which give another direction to the inferior ones.

Finally, man is endowed with faculties which are peculiar to him; and here it is to be investigated whether the faculties which distinguish man from animals, and which constitute the human character, are innate. It must be answered, that all the faculties of man are given by creation, and that human nature is as determinate as that of every other being. Thus though we see that *man* compares his sensations and ideas, inquires into the causes of phenomena, draws consequences, and discovers laws and general principles; that he measures distances and times, and crosses the sea from one extreme to another; that he acknowledges culpability, and worthiness; that he bears a monitor in his own breast, and raises his mind to the idea and adoration of God:—yet all these faculties result neither from accidental influ-

ence from without, nor are produced by his own will from within. How indeed, in the greatest and most important occupations, could the Creator abandon man and consign him to chance? No. Herein, as in all other circumstances, he has prescribed to man his sphere of activity, and guarded all his steps. It is only by these means that the same essential faculties are perpetuated in the human kind, faculties the existence of which we could never have conceived unless nature had conferred them upon us. In short, the innateness of the merely human faculties by the constancy of the human character; by the uniformity of the nature of man at all times and in all countries; by the tendency of natural genius; by the plurality of every genius; by the determinate character of each of the sexes; by the peculiarities of every individual; by the relation between the organization and the manifestations of the respective faculties; and finally, by the circumstance that man is a created being. As long therefore as all these proofs are unre-
futed, this principle of anthropology stands unshaken.

SECTION III.

ARE TRUTH AND THE KNOWLEDGE OF NATURE
DANGEROUS, OR IN OPPOSITION, TO MORALITY
AND RELIGION.

It is my intention to show, that “there is a much more exact correspondence between the natural and moral world, than we are apt to take notice of.” *—It is proved by incontestable facts, that the feelings and intellectual faculties are inherent in the nature of man, and that their manifestations depend on the organization: but ignorance often, and hypocrisy and envy sometimes, take part in the discussion. The basis of the doctrine is no longer attacked: it seems more convenient to blame its consequences; and, without knowing why or explaining how, to cry out that it is dangerous. This, in all ages, has been the reception of every discovery and invention. The disciples of the various philosophical schools of Greece inveighed against each other, and made reciprocal accusations of impiety and perjury.

* Bishop Butler, Serm. vi.

The people, in their turn, detested the philosophers, and accused those who investigated the causes of things of presumptuously invading the rights of the Divinity. Pythagoras was driven from Athens on account of his novel opinions; for the same reason Anaxagoras was confined in prison: and Socrates, for having demonstrated the unity of God, was forced to drink the juice of hemlock. Several of those who excelled in physics in the fourteenth century were punished with death as sorcerers or magicians. Galileo, when seventy years of age, was shut up in prison for having proved the motion of the earth. Vesalius, Varolius and Harvey, were persecuted on account of their discoveries. Those who maintained, at first, the influence of climate upon the intellectual faculties of man were suspected of materialism.

The example of Aristotle and Descartes may be quoted to show the good and bad fortune of new doctrines. The ancient antagonists of Aristotle caused his books to be burned; and, in the time of Francis I. the writings of Ramus against Aristotle were similarly destroyed, his adversaries were declared heretics, and under pain of being sent to the galleys philosophers were prohi-

bited from combating his opinions. At the present time, the philosophy of Aristotle is no longer spoken of.—Descartes was persecuted for teaching the doctrine of innate ideas; he was accused of atheism though he had written on the existence of God; and his books were burnt by order of the university of Paris. A short time after, the same university adopted the doctrine of innate ideas; and when Locke and Condillac attacked it, there was a general cry of materialism and fatalism. Thus the same opinions were considered at one time as dangerous because they were new, and at another as useful because they were ancient. What is to be inferred from this but that man deserves pity; that the opinions of contemporaries, in respect to the truth or falsehood, and the good or bad consequences imputed to a new doctrine, are altogether suspicious; and that the only object of an author ought to be that of pointing out the truth. Ancillon is therefore right in saying with Bonnet, Reason does not know any useless or dangerous truth. That which is, is. This is the only answer to be given to those who, valuing things only by the advantage they may produce, incessantly ask, *Cui bono*—*what is this*

good for ? and at the same time to those who anxiously ask, *To what does this lead ?* Jesus the son of Sirach long ago said, “ We ought not to demand, what is this good for ; the usefulness of every thing will be known in its due time.”

We are far from thinking that ignorance and knavery will not attack our doctrine with abuse : but what does not man abuse ? Tell him that he ought to expiate his crimes ; and in his superstition he will immolate his children. Have not Lucretius and his disciples employed all their genius and talents to demonstrate, that the belief in the immortality of the soul maintains the fear of death, and poisons all the enjoyments of life ; whereas Christians consider this belief as the basis of order and happiness, of morality and of the most efficacious comfort during the calamities of life ? To establish hospitals for inoculation or for vaccination, and to fix upon edifices a conductor for lightning, is, in the opinion of some persons, of the greatest service to humanity ; but in the eyes of others, it is an offence to Divine Providence. In one word, man finds in all things some cause of complaint ; and we can only say with St. Bernard, “ we ought to judge in a

different manner the complaints of the ignorant and those of the hypocritical. The former complain from ignorance, the latter from malice; the first because they do not know the truth, the second because they hate it."

Malebranche has very well painted the enemies of new truths. "Persons of solid and true piety," says he, "do not condemn what they do not understand; but the ignorant, the superstitious and hypocritical, do. The superstitious by a slavish fear become fierce, when they see an ingenious and penetrating man. If he assign the natural causes of thunder and its effects, they deem him an atheist. Hypocrites on the contrary, though led by particular motives, make use of truths generally venerated; and they combat new truths under the mask of some other truth: sometimes they deride secretly what every one respects, and produce in the minds of others a reputation which is the more to be feared, in proportion as the things which they abuse are more sacred."

As we maintain, that the manifestations of the mind depend on the organization, it is objected that thereby materialism is established; and as we show that the faculties of the

mind are inherent in the nature of man, it is said that this doctrine leads to fatalism. I shall first answer the objection of materialism; I shall then treat of fatalism: and at the end of moral liberty.

MATERIALISM.

It is said that, if the manifestations of the faculties of the mind depend on the organization, materialism will thereby be established. It is to be observed that the expression materialism has two different significations. One class of materialists maintain, that there is no Creator; that matter has always existed; and that all the phenomena of the world are the effects of matter. The ancient Roman church attached this signification to the expression materialism: and it is often the case at the present day, that materialism is employed as synonymous with atheism. Our assertion, however, that the manifestations of the mind depend on the organization, is far from this sort of materialism. A natural philosopher, who inquires into the laws of phenomena cannot be an atheist: he cannot consider the admirable and wise concatenation of all nature, the mutual relation between

all things, as destitute of a primitive cause. He is obliged, according to the laws of thought, to admit such a cause, a supreme understanding, an all-wise Creator.

Another kind of materialism is taught by those who admit a Creator, but who maintain, that man does not consist of two different substances—the body and soul, and that all the phenomena, ordinarily attributed to the soul, result only from the forms and the combinations of matter. The soul, in their opinion, is a fluid of extreme tenuity, distributed over all things, and enlivening the whole organization. Our doctrine of the physiology of the brain and nervous system has nothing in common with this opinion: we never endeavour to explain final causes; but have always declared, and every where do declare, that we make no inquiry into the nature of the soul, nor into that of the body: we are led only by experiment. Now we have seen that every faculty manifests itself by means of the organization:—but, when our antagonists maintain that we are materialists, they ought to prove that we teach that there is nothing but matter. The falsehood of their accusation is rendered very obvious by the following considerations. The expression

organ designates an instrument by means of which some faculty manifests itself: the muscles, for example, 'are the organs of voluntary motion, but the muscles are not the moving power; the eyes are the organ of sight, but the eyes are not the faculty of seeing. We separate the faculties of the soul or of the mind from the organs, and we consider the cerebral parts as the organs of these faculties, *viz.* as the instruments by means of which these faculties manifest themselves. Now even the adversaries of our doctrine must so far admit the dependance of the soul on the body. Professor Walter, of Berlin, imputed materialism to our doctrine; but in the same passage he says, In children the brain is pulpy, and in decrepid old age it is hard. It must have a certain degree of firmness and elasticity, that the soul may manifest itself with great splendour. But this consideration does not lead to materialism, it shows only the mutual union of the body and soul.

It results from what I have just said of our manner of teaching, that we are no more materialists than our predecessors, whether anatomists, physiologists or physicians, or than a great number of philosophers and mo-

ralists, *viz.* all those who admit the dependence of the soul on the body. For, in this respect, it is essentially the same, whether the faculties of the mind depend on the whole body, or on the whole brain, or whether every special faculty depends on a particular part of the brain: the manifestations of the faculties depend always on the organization.

FATALISM.

It is also objected to our doctrine that it leads to fatalism. Now it is necessary to understand exactly the meaning of this objection. Certain writers understand by fatalism, that every thing in the world, and the world itself, exist by necessity; that all events are the result of chance, and not at all the effect of any supreme intelligence. This fatalism involves atheism; but such fatalism is quite different from the doctrine, that man has received all his faculties by creation, and that his nature is determined by it. Another kind of fatalism teaches that all physical and moral laws are created and fixed; that there is no liberty in our actions; that man does good or evil according to his faculties; that he cannot

change his character; that his actions are irresistible; and consequently that he cannot be rewarded or punished for them.

Here we must make a distinction. It is certain that the faculties of the mind are not equally distributed. There are deaf, blind, stupid, idiotic and intelligent persons from birth. In the same way, the various feelings are not equally strong in all individuals. It is also certain, that the faculties of mankind and the laws to which they are subjected, as well as the laws of nature in general, are fixed by creation. All the faculties are given, and their laws are determinate in automatic and in animal life. Who for example has called himself to life? Does it depend on the will of any one to be born in this or that country? from these or those parents? under this or that system of government, or of religion? Who has determined his sex? Who can say: I am the eldest or youngest because it has been my choice? Who can determine the accidents which affect him, the capacities of his teachers, and of all those around him from the earliest infancy? Who can prepare and produce all external circumstances according to his will? The organs of automatic life

perform their functions without our will: the liver never can perform digestion; the kidneys never can secrete bile; and what is poison can never be changed into food, &c.

It is the same with animal life. The existence and the laws of the five external senses are an effect of creation. It does not depend on our will to have the power of seeing, hearing, feeling, smelling and tasting; we can never hear or see by means of the fingers, nor smell by means of the lips &c. It is impossible to see as red that which is blue, or to see as great that which is little. The determination of these faculties may doubtless be termed fatalism. We, in the same manner, maintain, that all the propensities, sentiments and intellectual faculties, their mutual influence and their various relations to each other, are innate and determined by creation. There is, however, a great difference between the innateness of the faculties and the irresistibility of their actions. The faculties are given, and without innate faculties no action is possible; but is there, on that account, no liberty in our actions? Are the actions of the faculties in man and animals irresistible?

Neither in animals nor in man are all the

faculties at the same moment active, and of irresistible force. It often happens in animals, that whilst one faculty is active the others are quiescent; and thus they perform rather one action than another. If this were not the case in animals, it would be cruel to punish them in order to prevent certain actions. If a dog who is hungry be punished for having eaten, do we not often observe that he will leave the food presented to him? And is it not the same with man? Man has a great number of faculties, but they are not always active and irresistible? We can walk, dance, sing, but we are not forced to do so? Who does not feel within himself, that he sometimes wishes for something, or inclines to perform some action, while he combats this inclination by other motives? Hence it is indubitable that the actions neither in animals nor in man are irresistible. The muscular system and the moving powers are given and innate, but we are not forced to move our limbs incessantly; and in the same way we shall see, that the greatest number of our faculties are subordinate to the will.

It is true that the faculties of the will, and the motives which determine the will, are

given and innate. This kind of fatalism must be admitted not only in man, but even in God; for perfection and all good powers are inherent in the nature of God: he cannot wish for evil. So also the superior faculties of man, called the divine part of his nature, must desire the real good of man. Hence a certain fatalism has its foundation in nature; and therefore the philosophers of China, Hindostan, Greece, the eastern and western Christians, and the followers of Mahomet, have blended a certain fatalism with their religious opinions. Indeed, it cannot be dangerous to teach such a fatalism in as far as it exists; for Christianity does so. "Who maketh thee to differ from another? and what hast thou that thou didst not receive?"* St. Augustine taught openly and distinctly our dependance on God, and he commanded to preach this truth. "As no one," says he, "can give to himself his life, so nobody can give to himself understanding."† He calls gifts of God, all good qualities, as the fear of God, charity, faith, obedience, justice, veracity.—He says,‡ that God has not distributed in an equal manner

* 1 Cor. iv. 7

† Lib. de Fide, c. 1.

‡ Lib. de Coreptione et Gratia.

noble sentiments any more than temporal good, as health, strength, riches, honours, the gifts of arts and sciences. It is then positive that the faculties are innate; but we must also say with St. Augustine,* God in giving the power does not inflict the necessity. Thus, I do not fear that the innateness of the faculties can produce irresistibility in our actions. The whole constitution of nature is determined by creation, but this necessity does not exclude deliberation, choice, preference, and acting from certain principles and to certain ends; because all this is matter of undoubted experience, acknowledged by all, and what every man may, every moment, be conscious of. We admit one sole Creator, who certainly has rendered consistent all physical and moral truth.

MORAL LIBERTY.

We know by daily experience that the faculties, though innate, are not compelled to act. Let us then examine, in what liberty consists, and how it is to be defined. Here the principal idea to be remembered is the plurality of the faculties and their respective organs. Whatever may be said

* Lib. de Litera et Spiritu, c. 31.

against them, it is indispensable for the philosopher of nature to admit them in animal life as well as in automatic life.

Let us now examine whether there be a subordination between the faculties of the mind.

It is a general law throughout all nature, that inferior faculties are subordinate to superior ones. Physical laws are submitted to chemical laws: gravity, for instance, is a physical law; and it is modified by chemical affinity. Thus the particles of any salt are attracted one to another in opposition to their physical gravity, and form a crystal. Again, physical and chemical laws, though preserved in organic beings, are modified by organic laws. Plants neither increase by juxtaposition; nor do they assimilate mere homogeneous substances. In the muscles and in the circulation of animals, the physical laws of motion and hydraulics are preserved, but they are subjected to the laws of life. Chemical laws are preserved in digestion, but they are modified by organic laws. Physical, chemical and organic laws exist in animals, but they are modified by animal laws. Animals take food, plants do the same; but animals choose it, guided by the sense of taste.

Plants propagate their species automatically, but animals feel a propensity to do so. Thus in animals the propensities, sentiments and intellectual faculties, modify extremely the properties of the organization.

The same principle must be applied to the laws of human nature; that is, all inferior laws, physical, chemical, organic and animal are preserved in man, but they must be subordinate to the laws of the human faculties. Thus all faculties are not equally important; and certain faculties must be subordinate to others. Therefore, in respect to actions, I divide the faculties into three orders. Certain faculties excite man and animals to determinate actions; as hunger, physical love, the propensities to fight, build, gather provision &c. I call these *faculties of action*. Other faculties are called *auxiliary*; because they assist and modify the faculties of the first kind. Still other faculties ought to direct; and these are termed the *directing faculties*.

LIBERTY.

Let us now examine in what liberty consists, and what faculties produce it? Some philosophers attribute to man an unlimited

or unbounded liberty: according to them man creates, so to say, his own nature; he is independent of every natural law; and his will is the only cause of his actions. *Such* liberty in a *created* being is contradictory; and hence all that can be said in favour of it is mere declamation, destitute of significance and truth.

Others maintain that the liberty of man is absolute, and that he acts without any motive. This is the same as saying, there is an effect without a cause; and such an assertion is against the laws of understanding. Moreover, liberty without motives would be in itself contradictory; for a person would thus act reasonably or unreasonably, justly or unjustly, well or ill, but always without any motive. Finally, in this supposition all institutions which respect the happiness of mankind would be useless. Education, morality, religion, punishment and reward, would be without effect, because man is not determined by any motive. According to this notion of liberty, we might expect from every one hatred and perfidy as well as friendship and fidelity, virtue as well as vice. Thus, such liberty is merely speculative. We can admit such liberty alone as corresponds with the general laws of nature, and with the

nature of man. Hence, if we admit that man acts by motives, then is he subjected, like all the rest of nature, to the law of cause and effect. This kind of liberty alone has been professed by ancient philosophers and legislators, and only this kind of liberty is supposed by morality and religion, because these furnish the most powerful and most noble motives to direct the actions of man. *Liberty consists in the possibility of doing or of not doing any thing, and in the faculty of knowing the motives and of determining one's-self according to them.* Three things then must be considered in liberty: knowledge and will; the motives; and the influence of the will upon the actions.

A great number of authors deny the existence of free-will, but they confound the propensities, inclinations, lusts and concupiscences, with *will*. The internal satisfaction alone, and will, are two quite different things. Neither man nor animals act freely, if they feel only an internal satisfaction; for this accompanies the fulfilling of every desire. The sheep and tiger do not act freely because they are pleased, the former with grazing, and the latter with tearing its prey in pieces. Every faculty of animal life, being active, gives a desire or

an inclination; and every man and animal feels these inclinations involuntarily. They cannot change the nature of their faculties and organization: they are forced to feel hunger, if the respective nerves act in a certain manner; and they must see, if the light strike the retina of their eyes. Thus man neither has any power upon accidental external impressions, nor upon the existence of internal organs; but is obliged to feel an inclination if the respective organ be excited. Man is not master of this, and he cannot be answerable for it. But these inclinations, propensities, or desires of different organs, are not yet *will*; for man and animals have often inclinations, yet *will* not. A dog, for example, which is hungry, but which has been beaten for having eaten such or such a thing, will not eat the meat you lay down before it:—it may be hungry, it wants; but it will not eat.—It is the same with man. How often are we obliged to act against our inclinations. Hence, by this experience, we see, not only that the faculties do not act irresistibly either in man or in animals, or, in other words, that there exists *liberty* or *freedom*, but also that inclinations are not yet *will*. However, freedom presup-

poses *will* ; therefore it is to be examined how *will* is performed.

In order to have *will*, to decide *for* or *against*, I must know what happens or has happened ; I must compare : hence *will* begins with the knowing and reflecting faculties, or with the understanding ; and therefore the will of every animal is proportionate to its understanding. Man has the greatest freedom, because his will has the greatest extent ; and this is the case because he has the greatest understanding. He knows more than any animal ; he has traditions ; he compares the present with the past ; he foresees the future ; he discovers the relation between cause and effect. It is even to be observed that not only *will*, but also our participation and accountableness, begin with the knowing faculties. Idiots have sometimes inclinations, but they are neither free, nor answerable ; and a man of great understanding and good education is more blameable for a fault, than an uncultivated and stupid person.

Thus the first condition of freedom is *will*, which is the effect of knowledge and reflection. The second part of freedom concerns what is to be known and compared,

that is, the motives. Will, then, is the decision of the understanding, but this decision takes place according to motives. Hence, I shall now consider the source of the motives. They result principally from the propensities and sentiments, and sometimes from the knowing faculties. Thus the motives are as numerous as the faculties; and even their energy depends on the energy of the faculties. Hence, an animal which has many and energetic faculties, has many and vigorous motives, and its freedom is proportionate to the strength of its will, and to the number and energy of its faculties or motives. Therefore will, or the faculty of choosing or deciding, is not sufficient, but the plurality of motives is also necessary to freedom. An animal endowed with only one faculty would not be susceptible of any other feeling or motive, and its knowing and reflecting faculties could not act upon this single faculty, so as to make a comparison or choice between motives, because there was only one motive: the animal would therefore act according to its single active propensity, and the action or inaction of this animal would be the only effect of the action or inaction of this single faculty. On the contrary, if ani-

mals be endowed with several faculties, they are susceptible of different feelings. It is true, that in this case the action of one faculty and its respective organ does not destroy either the existence or the action of any other faculty and its organ; but here it must at the same time be considered whether the animal acts without or with freedom; for the plurality of the faculties and organs alone is not sufficient. This idea is of essential importance; but was not sufficiently considered in our book on Innate Dispositions. If man or animals act by motives without will, they do not act freely. It is in that case only necessary that one faculty should be stronger than another in order to act. Give food to a hungry dog, and at the moment when he eats, make a hare run before him: the dog will eat or follow the hare according to its strongest propensity. Here is no freedom: the strongest propensity prevails. On the contrary, if another animal be endowed with the faculty of knowing and comparing; if, for instance, another dog which is fond of hunting, but which has been punished for having followed hares, feel a great propensity to follow a hare which passes before him; if he tremble and have

palpitations without pursuing the hare, there is liberty: the dog chooses between different motives. He *may*, but he *will* not. Thus liberty requires will and motives. It begins with the understanding, which knows and compares the different motives, and decides the action according to its choice. The plurality of the faculties produces only the plurality of motives; but will decides.

Even these two conditions do not yet constitute liberty: there is still a third wanting, *viz.* the influence of the will upon our actions. For, in the diseased state, it sometimes happens that we know the different motives; and that the will has yet no influence upon the actions; the faculties which constitute will may put in action certain faculties of the mind, while others are independent of it. We have seen, that while we are not answerable for our inclinations and sentiments, because they exist of themselves, and the will cannot put them in action, the will has a greater influence upon the intellectual faculties; it can reproduce their actions in thinking of different objects, their qualities and various relations to each other. The will has also an influence upon the five senses and voluntary motion. This is

the reason why man is answerable for his actions, though his inclinations and sentiments are involuntary. He has power over the use of the instruments of these independent faculties: but as soon as the external senses or voluntary motion are withdrawn from the influence of the will, liberty and therefore guilt cease.

Thus, liberty requires will, motives and the influence of the will upon the external instruments. This is indeed the only true idea of liberty; but this liberty is not yet moral liberty; and it consequently remains to be examined, where the morality of our actions begins.

MORAL LIBERTY.

As the faculties are different, it is to be considered whether they are equally important. This is the case neither in organic nor in animal life. The functions which contribute to the preservation of the body are not equally important: mastication, for instance, and the mixture of the food with saliva, are less important than digestion, circulation and assimilation; and the secretion of certain glands is less necessary than respiration &c. It is the same with animal life:

in respect to the external senses, every one would lose the sense of smell rather than that of sight. Who would not lose some talent, as the faculty of drawing, of music, of painting, rather than that of reflection and reasoning; and one sentiment, rather than another. Every one is offended if we call him stupid; but not so if we say that he possesses not such or such a talent. Moreover, if we examine the influence of the different faculties of animal life upon the happiness and preservation of mankind, it is easily observed that several faculties are much more important than others. Thus, the love of approbation is less important than benevolence; and the Christian religion places charity above faith and all other moral faculties. It must therefore be granted that the faculties of animal life have different degrees of importance. In this respect they may be divided into two classes, into those which are common to animals and man, and into those which are proper to man. This double nature of man is evident, and has been designated by different expressions; the flesh and spirit, or the animal and man, or the carnal and spiritual part of man.

It is now to be inquired whether the facult-

ties common to animals and man, or those which are proper to man, are the most important. The answer is obvious, and subject to no doubt. I have already shown that, according to a general law of nature, inferior faculties are subordinate to superior faculties. Man, by means of superior faculties, is master of other animals; and hence the faculties proper to him ought to govern and direct all inferior ones. Hence also it is evident that all motives are not equally important. In this respect, I lay down the following principle: all the motives which result from faculties common to man and animals present no morality, suppose no idea of conscience or duty, nor any idea of sin; for no animal is susceptible of these feelings. Moreover, as liberty begins with understanding, so morality begins with the faculty of duty and justice. Thus moral liberty is will, applied to absolute conscience. Absolutely good or moral actions therefore result, when will acts according to absolute conscience, or to the motives proper to mankind; and whatever is not conformable to will applied to the motive of absolute conscience, is absolute evil. Man then has not only the greatest liberty, for he has the

greatest will and the greatest number of motives, but he alone possesses moral liberty. As long as he determines himself to any action by motives common to animals, his actions are not primitively moral, though they may be conformable to moral actions. The inferior motives, however, must be employed; they must support, and sometimes supply the place of, the superior ones.

From all that I have said in respect to moral liberty, it results that no accountability takes place without liberty; that liberty begins with the understanding or with the faculties of knowing and choosing the motives, and of deciding according to them; that man has the greatest liberty; and that the faculties proper to man produce motives which constitute the morality of our actions.

CHAPTER VI.

PRACTICAL CONSIDERATIONS.

IN every science, the theoretical and practical part must be distinguished from each other. The former considers the principles of the science: and the latter applies them. At the beginning I have stated, that the knowledge of the human mind is interesting to natural philosophers, anatomists, physiologists, physicians, artists, teachers, moralists, and legislators. Hence our investigations have an influence upon all classes of men and every profession. I have already spoken of our improvements as to anatomy, physiology, the philosophy of the mind in general and its moral part in particular. It remains to treat of its importance in all social intercourse, in the fine arts, in education, criminal legislation and medicine.

SECTION I.

SOCIAL INTERCOURSE.

I have often repeated that, in speaking of the actions of man, it is not sufficient to

consider the size of the organs of the respective faculties, but that the internal organic constitution of the cerebral parts, the exercise of their faculties, and their mutual influence contribute to their different degrees of activity. I have also stated that on account of the different temperaments, we cannot compare either individuals of different species, or even different individuals of the same species, but that we only consider the various cerebral parts of the same individual. I shall now elucidate several other points to be considered by those who intend to practise our doctrine.

CHARACTERS AND TALENTS ARE DIFFERENT.

A few only of the manifestations of man are the result of any single faculty: his actions are mostly the effect of the various combinations of his faculties. It is therefore very important to consider those different combinations. Propensities may be combined with propensities, or with propensities and sentiments, or with propensities, sentiments and intellectual faculties. In the same way, every faculty may be combined with faculties of the same or of other kinds. The combinations of the propensities and sentiments with pro-

propensities and sentiments produce the different characters of men, and the combinations of the intellectual faculties, one with another, determine the different talents. It is obvious that very few characters and talents are simple, but that the greatest number of them is compound. Agreeable, polite and amiable characters result from the combinations of amiable, benevolent and superior sentiments. Firmness, conscientiousness and cautiousness, if predominant, render men serious in general. Characters become good and noble in proportion as the propensities and sentiments, which are common to man and animals, are subordinate to the sentiments proper to man. On the contrary, characters become impolite, disagreeable, immodest, partial, vindictive, corrupt or untractable, if the superior sentiments be less active, while self-esteem, covetiveness, and the propensities to conceal, to fight and to destroy, act with great energy.

MODIFICATIONS OF THE MANIFESTATIONS OF EVERY FACULTY.

Another very important point, which has hitherto been too much neglected, concerns the modifications of the manifestations of the

faculties. In philosophy, it is commonly admitted, that the world is different to every species of animals, and even to every individual of the same species. This is easily understood, when we consider that all the beings of nature are in relation one to another, and that the beings endowed with consciousness are acquainted with this relation, or, in other terms, perceive various impressions of the other beings. Now it is evident that every sentient being perceives impressions in proportion to the number and energy of its sentient faculties. Hence it results that the world is different to different species of animals; that it is essentially the same, but modified to the individuals of the same species; and that man, who unites all the faculties distributed among different animals, and possesses certain faculties peculiar to himself, has the most extended world; but that nevertheless the world of every person is modified, as well as that of every animal of the same species.

First, then, the manifestations of every faculty itself are greatly modified in different kinds of beings. The power of motion is modified in the muscles of different kinds of animals; and the consistence, texture and

taste of these different muscles vary. Moreover the five external senses present various modifications in different species of animals, and in different individuals of the same species. In the same way the manifestations of the propensities, sentiments and intellectual faculties are modified in different species, and in the different individuals of the same species. Nay it seems to me that they present idiosyncrasies, as well as is the case with digestion and the five senses.

Another reason of the modified manifestations of the faculties is their mutual influence. It is indubitable that if two or more persons do the same thing, it will be done with certain modifications by every one. In as far as the faculties are essentially the same, we find the same actions in all mankind: nay, in as far as the individuals of different nations have similar faculties, we observe a certain analogy in their actions and manners, because the actions are the effects of the special faculties and their combinations, and it is their modifications and different combinations that alone produce modifications in the actions. Every faculty then may be considered as combined with one, two, or more faculties. Hence it is evident that the num-

ber of binary, ternary and more multiplied combinations is immense, especially if we reflect that every faculty may be modified in itself, and may be more or less energetic. This object is of the highest importance in anthropology, and indispensable to the elucidation of our doctrine.

DIFFICULTY OF JUDGING THE ACTIONS OF OTHER PERSONS.

Having considered the modified manifestations of the faculties of the mind, natural order leads me to consider the difficulty of judging the actions of others, and determining their motives. From the preceding considerations it first results, that in every one the judgment, as well as the other functions in general, must be modified. Indeed if we attend to the judgments of different individuals in respect to the same object, if we observe their reflections, and consider what every one praises or blames, we may, by experience, be convinced of the truth of this assertion. It may indeed be admitted as a principle that every one judges according to the natural modifications, and the mutual influence, of his faculties; and that he judges others according to his

own nature, or that he takes himself as the measure of good and evil. If therefore great philosophers, moralists and others who are benevolent, consider, as to criminals and malefactors in general, the absolute conscience as their most severe judge, they suppose in them the sentiment which they themselves feel: they judge themselves in the actions of the others. In the same way whatever is conformable to our manner of feeling and thinking is approved, while the contrary is disapproved. Hence, in order to judge well, we must first distinguish the nature of man in general, from the modifications of every individual; and then we must know our own nature and our modifications, in order not to censure others according to our favourite sentiments or ideas. Thus we must judge others and ourselves according to the same measure—according to absolute good and evil.

It is also difficult to judge the actions of other persons, and to determine their real motives, because the motives of the same action or omission may be quite different. It is proverbially said that appearances are deceitful. If we consider any kind of action in man, we may observe different motives to

the same action in different individuals. One gives to the poor from ostentation, another from duty, a third from the hope of gaining heaven, and others again from real charity. One wishes to be acquainted with the situation of unfortunate persons before he does good; another gives as soon as he sees misery, and every one is his neighbour—his left hand will not know what his right hand does.

It is the same with the omissions of abuses. One, for instance, from charity does not steal; another steals every where except in the house of those with whom he lives; a third robs churches, but not the poor. Others do not steal for fear of being punished, or for fear of injuring their reputation, or from a sense of duty and justice &c. In short, everyone knows that the same action he has done, or has not done, was not always the effect of the same motive. Thus, if an action or omission must be judged, it is necessary to consider whether it is the result of the natural energy, and of the want of the respective faculty, or whether other faculties have influenced this action or its omission. Hence it follows, that, on one hand, every function does not suppose a large developement of the respective organ; and,

on the other hand, that the organs may be greatly developed without producing abuses. The organ of covetiveness may be very large without stealing. The activity of every organ produces only a corresponding inclination, but the mutual influence of the faculties must regulate their subordination. Thus we cannot judge other persons according to our sentiments and faculties, nor according to one or several of their faculties ; but besides their individual faculties, we must consider all their faculties together, and censure then the moral value of their actions, according to the absolute nature of man.

From the modifications of our faculties results a very important practical rule—indulgence. It is impossible that other persons should in every point feel and think as we do. In the same way as it is generally admitted, that the functions of the five external senses cannot be altogether the same, and without modification—as it is proverbially said, *De gustibus non est disputandum*, so also are the internal faculties modified, and no one has a right to desire other persons to feel and think in the same manner as he does. A certain indulgence is necessary in society. I do not maintain that every manner of feeling

and thinking, and every action must be tolerated. There is a common touchstone for every individual. The feelings, thoughts and actions, must be conformable to the absolute conscience of man; but all other modifications ought to be tolerated. This principle may be applied to both sexes, to all conditions and ages; and no friendship can be permanent without indulgence as to many modifications in the manner of feeling and thinking. It is the same in religious and other opinions. St. Paul said to the Romans, "One believeth that he may eat all things; another, who is weak, eateth herbs: let not him that eateth despise him that eateth not, and let not him that eateth not judge him that eateth. One man esteemeth one day above another, another esteemeth every day alike. Let every man be fully persuaded in his own mind. We then that are strong ought to bear the infirmities of the weak, and not to please ourselves. The kingdom of God is not meat and drink, but righteousness and peace."

ON SYMPATHY AND ANTIPATHY.

Throughout all nature beings have some relation to each other. As we have seen

that there are different relations between the different faculties of the same individual, so there exist different relations between the different faculties of different individuals. Indeed it is generally observed, that certain beings cannot exist in the society of others, while others are attached one to another. The attractive and repulsive power of physics, and the affinities of chemistry, are well known; and even among vegetables, certain species perish in the neighbourhood of certain others, while other species increase and prosper very well together. Among animals, this law exists not only in respect to different species, but also in respect to different individuals of the same kind.

It is the same with mankind. Certain individuals are as it were born one for each other, while others mutually feel an invincible aversion. This may be explained in the following manner. First, certain faculties of man are eminently social, as attachment and charity; and others are quite the contrary, as selfishness and pride. Moreover, according to a general rule, every faculty desires to be satisfied. Hence every person is pleased with that which is conformable to his manner of feeling and thinking: every one wishes to enjoy; and therefore every one likes those

who procure or permit to him enjoyments. Hence it may be easily conceived, that there is no permanent and invariable combination of faculties : on the contrary, their relations vary in the same degree as the modifications of the faculties of different individuals. Before we can decide whether two individuals sympathize or not, we must consider all their faculties. In this respect then, it is obvious that understanding likes understanding, and every kind of intellectual faculty likes a similar faculty. In the same way, the sentiments proper to man look for similar sentiments, A charitable person likes mild and good-natured people ; and religious persons prefer similar individuals. Thus, all the faculties of the understanding, and all the sentiments proper to man, are favourable to society.

It is not quite the same with the faculties common to man and animals. Certain of these faculties are also social, as adhesiveness and, in a certain degree, amativeness and philoprogenitiveness ; but the greatest number of these faculties are antisocial. Interested persons, for instance, do not like other interested individuals, except in as far as their own covetiveness is satisfied. Proud persons do not like other persons endowed with

the same faculty. Proud and interested persons not only dislike one another, but they are also disliked by persons endowed with the superior sentiments. Thus every one will sympathise with those in whose society his faculties are satisfied: and antipathy will be proportionate to the prevention of enjoyment.

SECTION II.

INFLUENCE OF OUR DOCTRINE UPON ARTS.

It is well known, that modern artists have entirely neglected the configuration of the head. I have often observed, that they give the shape of their own head to their figures, or they desire the individual they can most easily procure to sit for a model; attending in their choice to little else than age, sex &c. As, however, each talent and each peculiar character is inseparable from a peculiar form of the head, this must now become an essential study for artists, as well in order to imitate nature exactly, in the painting of portraits, as to compose ideal forms which are not in contradiction with natural configuration. Artists ought especially to be acquainted with the situations of the different

organs, their external signs, and the modifications of their developement; they ought to study the form and size of every head in general, and of its parts in particular; and they ought also to know the principles according to which the activity of the different faculties and their modes are distinguished. In one word, whatever concerns the physiognomical and pathognomical part of this science is indispensable to their art.

ON EDUCATION.

In the consideration on the innateness of our faculties, I have shown that education cannot produce any faculty; for before I could speak of the principles of education, it was necessary to point out the nature of men. I repeat that all the faculties of the mind are innate, and that their manifestations depend on particular organs. Hence education can take place only where the faculties, and the conditions of their manifestations, exist; for education is nothing but exercise, cultivation and direction.

Those who have the care of education will agree, that the acting powers are not equal

in all individuals; and therefore the first object to be examined is the cause of this difference, and the second whether we have any influence, and in what degree, over this cause. From our doctrine it follows that the material organs produce the difference of the manifestations of the mind. As moreover, it is impossible to exercise any power upon the faculties themselves, we are obliged to confine our examination to the conditions of the material organs. In this respect, man is submitted to the general law of living nature, and like other organised beings he participates in the properties of his parents so far as their organization is propagated. Hence the first principle of all education, or of all endeavours to perfect mankind, is to observe the same method which is kept in view in perfecting all other living beings, that is, to take care that the germ be good. It certainly is a pity that, in this respect, we take more care of the races of our sheep, pigs, dogs and horses, than of our own offspring.

After birth we have no more immediate power than before birth, upon the faculties themselves: we have some influence only upon the organization. At this period, how-

ever, it is that, strictly speaking, education begins. It is commonly divided into physical and moral; the former concerns the body, the latter the faculties of the mind. I divide education differently, though also into two parts. I consider, under the first part, whatever contributes to the activity of the faculties : and, in the second, whatever concerns the mutual influence of the faculties, and contributes to the morality of our actions, The first condition of a greater energy of the manifestations of the mind is the developement of the respective organs ; the second is the internal constitution of the organs : these two conditions then particularly constitute the object of physical education. The third condition is the exercise, and the fourth the mutual influence of the faculties.

In respect to exercise, as the third condition which contributes to a greater energy of the manifestations, I mention that its influence is observed throughout all living beings, as well as in the automatic and animal life of man. No exercise however can take place if the organ be not given ; and exercise will produce a different effect according to the developement, and the internal constitution of the organs. This part of

education is still extremely defective. I shall mention only its chief principles. First, to exercise is synonymous with putting in action: hence in exercising one faculty, we do not exercise another, and every faculty must be exercised in itself. Now what shall we say of that education which endeavours to cultivate feelings by exercising intellectual faculties or mere verbal memory? Is it conceivable that the feelings are not to be learned? The feelings must be educated and exercised in the same way as the intellectual faculties, that is, by putting them in action. Speak to a child of music, but prevent him from hearing it, and never permit him to play on any musical instrument—can you imagine that his faculties of tune will be exercised? Speak to a child of compassion, but let him never see any unfortunate being—will his benevolence be exercised? This consideration explains the ancient adage, *Verba movent, exempla trahunt*. Moreover no faculty can be exercised before its organ is developed. Certain organs, however, are early developed, and others increase later; some act early and last during life, and others begin to act early or late, and do not last till the end of life. This is necessary to be observed

in a correct plan of education. The fourth means of activity consists in the mutual influence of the faculties.

In order to understand the second part of education, which concerns the direction of the manifestations, it is necessary to recollect what I have said of the sphere of activity of every faculty, of their mutual influence, of their natural arrangement with respect to morality, and of the modifications of every individual. All these notions are necessary to education if it intend to direct action. The basis then of all education is, that the faculties common to man and animals ought to be directed by those which are proper to man. Moreover, it is to be considered that every one is fond of what gives him pleasure; for this principle, combined with that of morality, will greatly support the direction of the faculties.

A third principle is, that no action takes place without motive. The motives are of two kinds; superior or inferior. The former are the best; but if the manifestations of the superior faculties be very weak, we must supply their place by the inferior. Man is susceptible of shame, fear, interest, of the enjoyments of the five senses, of hunger and

thirst, of bodily pain and pleasure; he likes his personal freedom &c.; hence all these sensations become motives for him to act in various ways. It is also to be considered that, besides these two kinds of motives, the will contributes much to the direction of the actions, because the faculties of will render man attentive to the motives. Hence he who has more will, or whose reflecting faculties are more active, who compares better the present with the past, and foresees the future, who distinguishes easily the relation between cause and effect &c., will consider more exactly different motives, and will form a different decision from him who pays very little attention to them.

Another essential point to be considered in education is, that not every one is fit for every condition. Before I finish these considerations, I may mention another great error of education. Many things are learned in order to be unlearned, and auxiliary faculties often are not at all exercised. To obviate this it is necessary to know not only that every faculty in itself must be exercised, but also that certain faculties are required for different professions, arts or sciences. All the faculties proper to man ought to be exercised

in every one; but among the others a choice ought to be made, and those only which are indispensable or auxiliary ought to be exercised. I conclude this subject with the remark, that those who endeavour to educate men ought to begin by studying the nature of man.

SECTION IV.

INFLUENCE OF OUR DOCTRINE ON CRIMINAL LEGISLATION.

I shall on this subject mention only a few general ideas. First, I repeat the remark, that the nature of the human race is by no means known. It is therefore in no way astonishing that the means which have been and are still employed for correcting malefactors have not succeeded, and neither do nor can succeed, and that our houses of correction are houses of perversion. I consider the principles according to which institutions for correction and punishment ought to be established, as the continuation of education, that is, of the education of bad children. Neither all adult persons, nor all children, can be left to themselves, and to the motives which they

find in their minds; for these very often would not be sufficient to produce moral actions, and hence governments are obliged to direct the actions of society. Now it seems to me that the aim of all institutions ought to be essentially the same, that is, to render subordinate the actions of the faculties common to man and animals to those which are proper to man.

The superior faculties produce laws, and without them no law could exist. Hence every perfect institution ought to be founded upon all the superior faculties together: it is defective as soon as one faculty is neglected. In this way only it can be, according to the absolute conscience, wise, charitable, just, and immutable. Though the branches of legislation are very numerous, they ought all to have the same aim; and moral and religious precepts, and civil laws, ought to agree with each other. I also think that all the institutions, called houses of correction and prisons, ought to have the same aim, and be established upon the same principles. The faults, errors and crimes of adults must be prevented in the same way as those of children; I mean, by education in all its extent. Adult persons, who commit errors, ought to

be corrected; and if any one be incorrigible, society must be secured against him. It is not my intention to enter into details; I wish only to call the attention of moralists and legislators to the knowledge of human nature, and to show that our doctrine is intimately connected with all professions in society, and with all the actions of man.

SECTION IV.

INFLUENCE OF OUR DOCTRINE UPON MEDICINE, OR ON THE DERANGEMENTS OF THE MANIFESTATIONS OF THE MIND.

Considerations of this kind belong especially to medical men. I shall therefore develop only certain ideas which may have some interest with every intelligent reader. The first distinction to be made concerns the difference between the diseases of the brain with respect to its automatic life, and the derangements of the manifestations of the mind. The diseases of the brain, and the derangements of the mind, may perhaps be considered separately by philosophers; but they are too often so considered by phy-

sicians, though these latter never ought to do so. It would evidently be very odd if we should examine the diseases of the lungs, liver, stomach &c. without considering the derangements of their functions, or if we should speak of the derangements of respiration, secretion, digestion &c., without thinking of the diseased state of the relative organs. Physicians, however, who speak of the derangements of the manifestations of the mind without considering the cerebral organization, proceed in a similar manner. Such an error is immaterial as long as it is not applied to practice; but it is hurtful and unpardonable when it is necessary to act and to cure; or when institutions for such unfortunate creatures are established according to such conceptions.

I should be very happy could I call to the importance of these considerations the attention of those who contribute to the foundation and direction of similar institutions, which, according to their common arrangements, I should be inclined to consider as indeed mad-houses, not houses for madmen. They are at least an evident proof of our ignorance as to these diseases—an ignorance which does greater harm to humanity than

any kind of insanity. I cannot help confessing my indignation at such institutions, and my pity for those unfortunate creatures who are given up to chance only from our ignorance. What would a scientific physician think of hospitals wherein all patients were received indiscriminately, curable and incurable, cripples, blind, deaf and dumb, with acute, chronic, infectious and other affections, without any medical arrangement as to the cure of them—where the patients were only separated according to the payments made by their friends—where the rooms or wards were indeed kept clean, and every hurtful accident prevented, but where all care was confined to a good physical and, as it is called, moral treatment—where the permanent direction of the institution was entrusted to a man who had no idea of any disease, and who considered this object only as a pecuniary affair—and where the plan of distribution of such institutions was committed to architects? Is it not then shocking to be obliged to say, that all these faults may be observed in many institutions for the insane? A great deal is spoken of moral treatment; and it is justly considered as more important than the medical; but I

cannot call it rational, because it is not adapted to the nature of man. Even the most obvious idea, the indispensable necessity of separating the patients, is neglected. The most furious and the most gloomy and melancholy, the most imperious and the most fearful and anxious, the idiot and the most vociferous, the most religious and most villanous, are put together. If this be moral treatment, then that expression seems to me synonymous with ignorant and stupid. I shall not detail other defects which may be observed in such institutions. These cannot be perfectly regulated before the nature of the mind and of its manifestations is pointed out. In general it was till the present time impossible to conceive the nature of the derangements of the manifestations of the mind, because the conditions necessary in the healthy state were not known. As it is certain that all the manifestations of the mind take place by means of the organization, and as the organization (not the mind itself which is immaterial) may be deranged, the derangements of the manifestations of the mind are easily understood. It is obvious that the physiology and pathology of the brain are submitted to the same principles as those of

the other parts of the body, and all that may be taught of these is also applicable to the brain.

Among the perceptible diseases of the brain, its defective or too rapid developement is to be mentioned. This latter ought to be adverted to by all parents whose children increase rapidly, especially if this be the case with their head. On account of such rapid increase the organs are not sufficiently strengthened, and such children are exposed to various accidents, particularly to inflammation, and acute dropsy of the brain. I am convinced of this truth by numerous dissections. During the period of dentition they require particular attention. At this age the inflammation of the brain is very dangerous, and easily overlooked, because it is not accompanied with violent delirium, fury and similar signs. Physicians are generally wrong in thinking that violent delirium and fury are the only signs of inflammation of the brain. In these cases, the bodily strength of children seems indeed to be weakened and even exhausted, and the apparent weakness is often accompanied with numbness, convulsions, coldness and paleness. I need only mention, that the minds

of delicate children who have a large head, or even of those whose head increases rapidly, though they are in good health, ought not to be occupied too early and too seriously; and whatever carries the blood toward the head ought to be avoided. The faculties of the mind in those children act commonly with too great energy. It takes place most frequently from two to nine years. In general it happens with the brain as with all other parts: the frequency of disease coincides with developement, and the greatest energy of faculty.

It is evident that we cannot accede to the common division of mental diseases. This is founded upon a division of the pretended faculties of the mind. But I have shown that, till the present time, the particular faculties of the mind were not known; and hence it was impossible to make a true division of their derangements. If my division of the faculties be true, the derangements of the mind will be divided in the same manner. There will be derangements of propensities, of sentiments, and of intellectual faculties. All derangements will be considered as the immediate or mediate result of the disturbance of the organs. Every reasonable mode

of treatment then must be determined according to the cause and nature of the disease, and modified according to the individual constitution, age and peculiar circumstances of the patient; and if this be not the case, or if it be impossible, the whole curative proceeding will be vague and merely experimental.

RECAPITULATION AND CONCLUSION.

From all that I have stated, in respect to the knowledge of man, it results that the method of studying his nature must in future be different from what it hitherto has been, that we have shown the real structure of the nervous system of animal life, established a physiology of that organ and of the external senses, and reduced the physiognomical knowledge of the mind and its natural language, or pathognomy, to positive principles; that the philosophy of the mind must be entirely changed; that our doctrine does not lead to materialism and fatalism, but elucidates the reality and determinate meaning of moral liberty; that thereby our judgement is guided in every social intercourse; that its application is indispensable to artists; that

education and the reform of criminals ought to be founded on the knowledge of man ; and finally that no pathology of the manifestations of the mind can be established, before the conditions of their healthy state are determined. Thus, with respect to the subject of our inquiries, I believe I have justified the assertion, that it seems impossible to point out an object more interesting to natural philosophers, anatomists, physiologists, physicians, artists, teachers, moralists and legislators.

*Explanation of the Numbers referring to the
various Organs.*

1. Organ of amateness.
2. ——— philoprogenitiveness, (*love
of offspring.*)
3. ——— inhabitiveness?
4. ——— adhesiveness.
5. ——— combativeness.
6. ——— destructiveness.
7. ——— constructiveness.
8. ——— covetiveness.
9. ——— secretiveness.
10. ——— self-esteem.
11. ——— love of approbation.
12. ——— cautiousness.
13. ——— benevolence.
14. ——— veneration.
15. ——— hope.
16. ——— ideality.
17. ——— conscientiousness.
18. ——— firmness.
19. ——— individuality.
20. ——— form.
21. ——— size?
22. ——— weight and momenta?
23. ——— colouring.
24. ——— locality.
25. ——— order?

- 26. Organ of time ?
- 27. ——— number.
- 28. ——— tune.
- 29. ——— language.
- 30. ——— comparison.
- 31. ——— causality.
- 32. ——— wit.
- 33. ——— imitation.

THE END.









